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By-Gustafson, Kent L.

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The purpose of this research experiment was to investigate the effectiveness of one type of simulation (consisting of a series of anxiety-inducing motion picture vignettes, split-screen video tape recording, and a trained recall worker) in reducing anxiety and thereby increasing the subsequent classroom interaction of student teachers. A secondary purpose was to test the statement made by Cherryholmes (1966) and others that simulation cannot change attitudes. A pretest-posttest design, applied to 30 students randomly selected from a secondary methods course and randomly assigned to provide equal size experimental and control groups, led to several conclusions regarding the effectiveness of this type of simulation experience. The simulation experience did not lower the general anxiety level of student teachers (as measured by the IPAT Anxiety Scale). It did not lower the concern of the subjects for classroom discipline (Triplett instrument), nor increase their self-concept (researcher-designed instrument), nor increase the success rating assigned to student teachers by their student-teaching coordinators. Although student talk, as measured by Flanders' interaction system, did increase in classrooms of student teachers who had the simulation experience, student-initiated talk did not increase. Thus, the one positive finding is suspect since no other directional hypotheses were supported. (Author/JS)

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Simulation of Anxiety Situations and Its Resultant Effect on Anxiety and Classroom Interaction of Student Teachers

Kent L. Gustafson

Michigan State University

East Lansing, Michigan 48823

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TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS ii

LIST OF TABLES. vi

LIST OF APPENDICES vii

Chapter

I. INTRODUCTON AND THEORY OF STUDY 1

Introduction. 1
Importance of the Study 2
Definitions 4
Theory Underlying the Study. 6
Anxiety 7
Interaction 9
Relation of Interaction to Anxiety . 10
Good Teaching and/or Learning . . . 15
Relationship between Interaction and Good Teaching 21
Hypotheses 24
Summary 25

II. REVIEW OF THE LITERATURE. 26

Introduction. 26
Military Applications of Simulation . . 27
Simulation in Business and Industry . . 31
Simulation in Education 40

III. DESIGN OF THE STUDY 49

Introduction. 49
Physical Facilities 49
Films 50
Recall Workers 51
The Treatment 52
The Population 58
The Sample 59
Instrumentation. 60
Anxiety 60
Classroom Interaction. 62
Success in Student Teaching. . . . 66
Self-concept. 67
Concerns about Student Teaching . . 69

Chapter | Page

Preparation of Recall Workers 70
Preparation of Interaction Analysis Workers 72
The Experimental Design 74
Statistical Hypotheses 75
Analysis of the Data 78
Limitations of the Study. 80
Summary 83

IV. FINDINGS 88

Findings 88
Discussion of the Findings 101

V. SUMMARY AND CONCLUSIONS 114

Summary 114
Conclusions 120
Implications for Future Research . . . 121

BIBLIOGRAPHY 129

APPENDICES 136

LIST OF TABLES

Table | Page

1. Analysis of Covariance of the IPAT Pre- and Post-tests of Anxiety for the Experimental and Control Groups 91
2. Analysis of Variance for "Student-Initiated Talk" for the Experimental and Control Groups 93
3. Analysis of Variance for "Student Talk" for the Experimental and Control Groups . 95
4. Analysis of Variance for "Success in Student Teaching" for the Experimental and Control Groups 96
5. Analysis of Variance for "Concern for Classroom Control" for the Experimental and Control Groups 98
6. Analysis of Variance for "Self-Concept of Myself as an Interactor With My Students" for the Experimental and Control Groups . 100
7. Analysis of Variance for "Student Response" of the Experimental and Control Groups . 104

LIST OF APPENDICES

Appendix Page

A. Diagram of the Simulator 136

B. The Simulator Films. 138

C. The IPAT Anxiety Test 148

D. Categories for Interaction Analysis . . 150

E. Success Rating Chart 152

F. Semantic Differential Attitude Scale . . 154

G. Student Teachers Ranking of Needs . . . 157

H. Composite Data on All Ten Interaction Categories for the Experimental and Control Groups 159

CHAPTER I

INTRODUCTION AND THEORY OF STUDY

Introduction

The research reported in this report was conducted at Michigan State University during fall and winter quarters of the 1968-69 academic year. The purpose of the research was to investigate the effectiveness of simulating anxiety situations in reducing anxiety and increasing the classroom interaction of student teachers. The simulation included filmed vignettes of classroom situations portraying rejection of the teacher by the student and hostility toward the teacher by the student. During each viewing session, the viewer was video taped to assist him later in recalling his feelings and emotions while watching a split screen video tape of himself and the film he had watched.

A second purpose of the research was to test the statement made by Cherryholmes (1966) and others that simulation cannot change attitudes. The simulator used in the present research was different from those used by other researchers, thus providing an opportunity to test Cherryholmes' statement against a different simulation technique.

If the simulator used in the present research does reduce anxiety and increase interaction, a valuable training tool will have been discovered for use in teacher preparation programs. Also, if effective, this simulation could be expanded to include other types of emotions such as hostility and rejection exhibited by the teacher.

Importance of the Study

In the classroom of tomorrow, where the student teacher of today will exercise his professional skills, he will need to be a skillful interactor with children. Tomorrow's good teacher will, according to Heil (1962), not only tolerate but encourage interaction with the students, and allow children freedom to actively participate, offer spontaneous contributions, and share responsibilities. Other influential educational writers are equally positive in their concern for interaction between teacher and student. For example, Coombs (1965) states, "The feeling of belonging (the child's) is a consequence of interaction" (p. 168). And Brunner (1966) writes, "Intellectual development depends on a systematic and contingent interaction between tutor and learner" (p. 6).

Thus, it would appear that interactive skill on the part of teacher trainees is a desirable goal. But evidence is available that present teacher preparation programs cannot provide the experiences necessary for building teacher skill as an interactor. Several education writers have suggested the major reason for the lack of interaction skill development is the stressful nature of the student teacher's interaction with his students. Jenkins and Lippit (1965) write, "It is far from easy for anyone to analyze interpersonal situations in which he himself is involved" (p. 19). Coombs (1965) writes, "It follows then, that in order to help an individual explore and discover a more effective self, we must begin by creating atmospheres sufficiently free of threat so that the self can be explored and examined" (p. 34).

How can this problem of detaching oneself from involvement be solved to encourage introspection and self understanding on the part of the teacher trainee? Jersild (1965) offers the following advice, "Self understanding requires something quite different from the methods, study plans, and skills of a 'know-how' sort that are usually emphasized in education" (p. 3). He continues, "What is needed is a more personal kind of searching which will enable the teacher to identify his own concerns and share the concerns of his students" (p. 3). Jenkins and Lippit (1965) offer the following suggestions, "To carry through sound diagnosis of an interpersonal relationship means the concepts of 'correct' and 'incorrect' must be abandoned and the search directed toward discovering the reasons behind behavior" (p. 20).

The invention of video tape with its capability to record and immediately play back the recording provides part of the solution to the self-involvement problem. Namely, a person can experience a situation, and immediately view a playback of the situation permitting a more detached observation of what occurred. Adding another person, who is trained to assist in the recall without evaluating "correctness" of comments, provides the second part of a procedure for assisting teacher trainees in modifying their attitudes and behavior.

Thus, the present research has the potential of discovering an effective procedure for improving the quality of teacher preparation programs. Additionally, the procedure is simple enough that it could be adopted by virtually any teacher training institution. Therefore, the present research findings have significant implications for all educators in the field of teacher education.

Definitions

Several terms used in subsequent discussion require precise definition. Some terms, such as "interaction" and "simulation," require definition since educators use them to describe a variety of different situations. Other terms, such as "recall worker" and "per cent of student talk," need definition since they are not part of the educator's standard vocabulary.

Interaction

The verbal interchange between a teacher and students. To be measured with the Flanders-Amidon instrument.

Recall Worker

Specially trained individual to aid subject in recalling feelings and emotions felt during the simulation.

Simulation

Use of a film and film projector to create anxiety-producing situations for subjects.

Simulator

Small room containing two chairs, film projector, film, screen and partially concealed television camera, monitor, and microphone.

Student Teacher

Full-time Michigan State University undergraduate student enrolled in Education 436 during winter term, 1969.

Per Cent of Teacher Talk

Flanders-Amidon term for the numerical value obtained by dividing total observation time into the time classified in categories 1-7 (inclusive on their instrument).

Per Cent of Student Talk

Flanders-Amidon term for the numerical value obtained by dividing total observation time into the time classified in categories 8 and 9 on their instrument.

Student Initiated Talk

Flanders-Amidon term for the amount of time classified in category 9 on their instrument.

Theory Underlying the Study

To build an adequate theoretical base it is necessary to analyze three concepts and establish the connection among them. The concepts are: (1) anxiety, (3) interaction, and (3) good teaching. It is necessary to examine three variables rather than the more conventional approach of employing only two variables, since good teaching cannot be evaluated per se. That is, good teaching can only be examined through one or more intervening criterion variables. Any of several intervening criterion variables could be studied, but interaction was selected for reasons to be discussed later in this chapter. The theoretical position is that a teacher's anxiety affects his verbal interaction with students and by examining his verbal interaction pattern we can make judgments concerning the quality of his teaching. The balance of this section is devoted to a discussion of anxiety and its affect on verbal interaction, as well as the relationship between verbal interaction and good teaching. The ultimate goal of the discussion is to support the position that lower teacher anxiety results in more effective teaching.

Anxiety

Anxiety is frequently classified into two forms, generalized or "free floating" and specific or "directed" anxiety (Cattell and Scheier, 1961). The first type is a personality variable that remains relatively stable over a variety of situations. That is, the person feels anxiety regardless of the situation in which he finds himself. On the other hand, directed anxiety--sometimes also referred to as focused anxiety--is specific to a given situation or group of related situations.

An example of generalized anxiety for a teacher might be a feeling that maybe he really shouldn't be a teacher, but he really doesn't know why. If he develops specific reasons for this general feeling of anxiety they become sources of directed anxiety. If, for example, he decides he may not be able to control the students and maintain discipline, he has now moved into the directed anxiety area.

Another dimension of anxiety is the intensity with which it is felt (Cattell and Scheier, 1961). Obviously everyone feels both types of anxiety at various times but people vary greatly in the intensity of the emotion.

A teacher who is somewhat anxious about his ability to control a group of students but forgets this as soon as the class actually starts is probably less anxious than the teacher who is constantly aware of this feeling even while he is teaching.

This leads to a third dimension of anxiety--time. A person may feel pre-situational or anticipated anxiety before actually entering the situation. In fact, there is no guarantee that he will encounter the situation even if he feels anxiety about it. A prime example of this is the student teacher who is worried that the class, or members of the class, might physically attack him. In actuality this rarely happens, but studied indicate many student teachers worry about it (Anderson, 1960). The point is, that the probability of the event actually occurring often has little effect on anticipated anxiety.

Anxiety may also be felt during an event or even after the event has occurred (Cattell and Scheier, 1961). Typically, low level anxiety is fairly well suppressed during the actual event, but high levels of anxiety may seriously affect the person's actions during the event. Following completion of the event and removal from the situation, a person may generate or continue to feel anxiety. Post-situational anxiety, then, may or may not occur if the person has not "learned to control his anxiety." This post-situational anxiety is probably a hybrid form of pre-situational anxiety since at least part of the anxiety is focused on the anticipated "next time" (Cattell and Scheier, 1961).

Interaction

As was indicated earlier, interaction is defined in several different ways by various writers. However, the researcher has chosen a single definition--amount and type of verbal interaction--, since presently it is the only definition capable of empirical observation and quantification.

Without making judgments at this point about what is good teaching, it is still possible to describe amounts and types of verbal interaction. Later in this discussion the question of good teaching (or learning) will be considered and the connection between verbal interaction and good teaching will be established.

Any discussion of verbal interaction assumes that the behavior of each of the parties to the interface affects the behavior of the other party. If the teacher asks a question and no student reacts, there is no interaction. Likewise, if a student asks a question and the teacher continues to lecture, there is no interaction. Interaction becomes a regulating and guiding factor when both parties permit it to function. It becomes feedback for the teacher on his effectiveness and reinforcement for the student.

Flanders (1963) has developed a classification system for verbal interaction between teachers and students. He suggests that teacher talk can be divided into seven categories and student talk into two categories. By measuring the amount of time classified into each category during a given observation period, the amount of interaction between teacher and student can be calculated.

If one is prepared to make value judgments about what is good teaching and learning--which the research will do in a later section--any of the interaction categories may be examined. Flanders' original ten categories will be collapsed to four categories, because categories one through seven all measure teacher talk. Flanders (Amidon and Hough, 1967) suggests that when only a gross measure of the teacher's interaction is desired it is appropriate to collapse his teacher talk categories into a single category. Student talk will be measured using Flanders' two original categories. A fourth category will be employed to classify all extraneous and otherwise unclassifiable activities. The fourth category is not used in any of the analysis, except computation of interscorer agreement. The relation of the three interaction categories to good teaching and learning will be considered later in establishing the link between interaction and good teaching.

Relation of Interaction to Anxiety

For purposes of the present research, interaction is considered to be "caused by" or to be a dependent variable in relation to anxiety. That is, the amount and type of verbal interaction exhibited by a teacher depends on his level of anxiety. This is not to say that interaction depends solely on anxiety, but rather that anxiety has a major influence on interaction patterns. It should be pointed out that anxiety does not determine whether or not there is interaction, but only the type of interaction pattern. For example, there is always interaction in the classroom, but the amount of student initiated talk depends on the teacher's anxiety and defensiveness. Petruich (1966), writing on a study of the effect of anxiety on interaction, states, "Data suggested that a better psychological climate for pupils (for interaction) might obtain in a classroom where the student teacher's anxiety state level was low to average" (p. 1691).

The relationship between anxiety and interaction is complex due to the several types of anxiety discussed previously and the compounding effects of changing the level of anxiety. Another problem frequently increasing the complexity of the relationship is the lack of valid anxiety measuring instruments. Several research findings will be considered below, but they suffer from lack of direct comparability since the researchers studied different aspects of the problem.

Most of the research on anxiety and interaction has been conducted using high levels of anxiety. Results are generally consistent and indicate that anxiety acts to inhibit interaction. Meerloo (1967) states, "Stress or threatening emotional experiences can cause inadequate communication," and Zimbardo (1963) reports, ". . . anxiety usually interferes with performance . . . anxiety raises defensive responses" (p. 146). Zuckerman (1960) reports that people who score higher on an anxiety index also score high on an introversion scale and have significantly higher defensiveness. Kagan _et al_. (1967) state that high anxiety produces defense mechanisms. Maintenance of defense mechanisms requires excessive amounts of psychic energy and therefore this energy is not available for interaction with others.

Other writers also mention higher defensiveness as a result of anxiety. Sarason (1960) states, "Anxiety is a painful experience which sets in motion a variety of defensive or avoidance reactions" (p. 265). Brown (1966) states, "Feelings of anxiety . . . can produce defensive task-oriented behavior" (p. 71). A defensive task-oriented teacher will not allow free interchange of ideas and the resulting increase in interaction.

Gibb, Bryne and Sullivan all report that anxiety and defensiveness reduce effective communication. Bryne (1963) reports that low interaction is characterized by (a) fear of rejection, (b) attitude toward interaction as being psychologically unrewarding, and (c) negative attitudes toward interaction. Sullivan (1953) reports that anxiety acts in opposition to an adequate self system for communication. In fact, he defines "dynamism" as, ". . . to avoid or minimize anxiety situations by careful organization of experience" (p. 374). Probably the strongest statements are made by Gibb (1965) who defines defensive behavior as ". . . that behavior which occurs when an individual perceives threat or anticipates threat in the group" (p. 221). Gibb goes on to say that, "If one is to make fundamental improvements in communication he must make changes in interpersonal relationships. One type of alteration is that of reducing the degree of defensiveness" (p. 221). He also indicates that feelings of defensiveness by the communicator tend to create similar defensive posture in others.

In related research Bronfenbrenner (1945) and others have studied the question of levels of anxiety and report a somewhat curvilinear relationship between level of anxiety and learning. He reports that low levels of anxiety actually increase learning and probably act as a source of motivation. As the level of anxiety increases, learning also increases to a certain point. Beyond this point increases in anxiety result in decreased learning. At extremely high levels of anxiety the person becomes almost incapable of learning even the simplest task.

The research on levels of anxiety is not directly comparable to that mentioned earlier since the dependent variable is learning rather than interaction. However, in another section the writer will support the position that learning generally requires interaction. If this position is accepted, there is some basis for implying that levels of anxiety affect interaction in much the same way they affect learning.

Several studies indicate that student teachers do have anxieties about their performance in the classroom. One common and intensive anxiety concerns classroom discipline. Anderson (1960) reports that 29% of prospective teachers had anxiety about their ability to maintain classroom control. It is interesting that he classified maintaining classroom rapport under discipline. Travers, et al. (1953) state that discipline is the major concern of student teachers before entering the classroom and it is also their major concern after completing their student teaching experience. As recently as November, 1967, Triplett (1967) reported that handling classroom control (discipline) was the number two concern of elementary level student teachers before student teaching and their number three concern following student teaching.

Apparently then, discipline remains a major source of anxiety even after completion of teacher preparation courses. This is probably true for two reasons. First, the curriculum of teacher education does not adequately train students to adjust to this anxiety. Second, research shows how resistant attitudes are to change, and anxiety has roots in attitudes and perceptions. Greenberg's (1968) research is typical of attempted attitude change. He reports that giving people information will not change attitudes even if they accept the information as true.

Thus, it appears that anxiety does affect the type of interaction occurring in the classroom. Teachers who have low anxiety will be less defensive and more willing to permit more student initiated talk since they have less concern about their ability to maintain control in a variety of situations. On the other hand, teachers having high anxiety may be expected to permit less student talk, and permit students to answer only specific questions posed by the teacher. A high anxiety teacher is expected not to permit or encourage students to ask searching questions, or question statements made by the teacher.

Good Teaching and/or Learning

Any discussion of what constitutes "good" teaching must be recognized as being considered within a philosophical framework that is not universal. Therefore, although the researcher will develop what he considers a logical argument for his position, he recognizes that others viewing it from a different philosophical perspective may find it neither logical nor adequate.

The question of "What is good teaching?" has haunted educational researchers for many years and no evidence points to early agreement on the many issues involved. Steeves (1965) reports that over half of each meeting of the Association for Student Teaching for the last 20 years has been devoted to this issue. Cogan (1967) lists the five general types of criteria most frequently used in evaluating teacher competence. They include (1) practice teaching marks or ratings, (2) in-service ratings, (3) college grades or scholarship, (4) the consensus of persons competent to judge and in a position to observe, and (5) measures of pupil growth (p. 66).

Each of the five criteria listed above has its advantages and disadvantages. The criterion having the greatest attraction for researchers studying behavior is pupil growth. As Betts (1935) notes, "Perhaps the most direct method for evaluating the functional effectiveness of a teacher is to measure the changes wrought in pupils under her instruction" (p. 87). Since teachers are expected to change pupil behavior this method has a certain logical inevitability.

However, this criterion is not as simple and logical as it appears at first glance. Even Rostker (1945) whose position is that "Since a teacher is engaged to teach and modify the behavior of her pupils, the degree to which changes are produced in her pupils is a reflection of the ability of the teacher" (p. 6), has doubts about its use as a criterion variable. In fact he warns,

> It cannot, however, be overemphasized that the measurable pupil changes attained in (his own) study are limited by the type of tests applied to the pupils. The use of pupil changes as the criterion of teaching ability depends on the tests applied to the pupils and whatever implications are to be drawn must be limited by the tests employed (p. 7).

McCall (1952) and Jersild (1941) among others suggest at least three unsolved problems using pupil growth as a measure of teacher competence. They include (1) inadequate subject-matter tests, (2) lack of precise instruments for measuring changes in social and learning skills, and (3) difficulty in isolating changes due to an individual teacher (this is especially true in a departmentalized school).

Therefore, it would seem that use of the pupil growth criterion must await the availability of more refined and precise instruments. Domas (1950) succinctly summarizes the present state of the art by stating, "The present status of measurement techniques and the impossibility of eliminating factors in pupil growth not attributable to the teacher being evaluated combine to make this approach impracticable at this time" (p. 4).

In contrast to the pupil growth criterion, Ryans (1949) and Fattu (1962) both report that the most commonly used criterion is rating of the teacher by experts. This criterion suffers mainly from the fact that the measurement is made at a point several steps removed from the criterion generally accepted as valid--pupil growth. The major difficulty is that the raters are likely to make evaluations on criteria that are irrelevant to pupil change. The inferential leap that must be made between these criteria and pupil growth is at best a risky proposition. Also, experience with ratings indicates that such evaluations are likely to show great variance. When an effort is made to standardize the ratings and achieve reliability, the validity of the evaluations can be seriously challenged. Cogan (1967) states:

> The criteria upon which such (expert ratings) evaluations must be based are not standardized, and many of the most successful efforts to achieve reliability of ratings seem not to convey an equal conviction of validity. The reliability thus achieved gives the impression that a self-validating cycle has been completed. The apparently securely based structure of measurement sags alarmingly under the impact of a question as to the relationship of these reliable measures to the logically defensible consequents: pupil change and pupil behavior (p. 67).

Intelligence measures and scholastic performances of teachers can be criticized on the same grounds as teacher ratings. Namely that they are far removed from pupil behavior. In addition, research on these criteria has been confusing and contradictory. Rostker (1945) reports that teacher intelligence is the highest single factor conditioning teaching ability. On the other hand, a follow-up study by Rolfe (1945) reports, "Intelligence as measured by the American Council Psychology examination seems not to be related to teaching efficiency (r = -0.10)" (pp. 73-74).

From the preceding discussion one might conclude with despair that the problem of evaluating teaching, at least temporarily, is unsolvable and look to other areas that promise more fertile soil for research. However, some researchers have continued to work on the problem and in recent years have developed a new technique for examining teacher behavior. This system studies the verbal interaction between the teacher and the student and, depending on the type of instrument, classifies the behavior of both teacher and student into various categories.

Although verbal interaction analysis can be criticized on the same basis as those criteria mentioned earlier, it has a more parsimonious set of assumptions associated with it. First, while it still does not measure student growth, it does measure one kind of student behavior. In Flanders' (1963) instrument, student behaviors are divided into two categories, (1) student response to teacher question, and (2) self-initiated student response. This is not to say that just because either or both of these occur in the classroom that the student will learn. Activity by the student must be judged against a value scale of desired pupil behaviors before such a statement can be made. However, the researcher takes the position that activity is generally necessary before learning occurs. Philosophically this can be defended from the Deweyan position that, "There is an intimate and necessary relation between the process of actual experience and education" (Dewey, 1938), p. 7). On the psychological side it is supported by most learning theories which stress the importance of active behavior by the learner. Among the psychologists who support this position are: Skinner, stimulus response; Lewin, cognitive field theory; Spence, quantitative S-R theory; and Kohler, Gestalt psychology (Carpenter and Haddan, 1964).

To repeat the fundamental position taken on pupil activity, the present study does not assume that all activity leads to educative experience. Nor is there an assumption of an equation between activity and learning. The position is that in general terms there must be performance of activity before learning occurs. That is, activity is a necessary, but not sufficient, element in the learning process. No value judgment is made about the value of such experience to the student.

Teacher behavior is also measured on the assumption that it affects student behavior. Although this would seem more than obvious, it can be supported theoretically by the work of Miller and Dollard (1950). Their work in "social learning concepts" presents a learning theory which examines learning as a function of the social situation. They feel the learner learns what he learns, as well as how he learns, within a social context which prescribes both of them. The learner learns what he learns because the society, or its representative the teacher, indicates what is expected of him. How the learner learns depends on how stimuli are presented to him, which again is a function of the teacher as society's representative.

Murray (1938) and others have written extensively about teacher behavior. They suggest a number of teacher characteristics that profoundly affect student behavior. The following are considered by Cogan (1967) to be the most relevant teacher behaviors that structure the climate of the classroom: (1) dominance; (2) aggression; (3) affiliation; (4) rejection; (5) nurturance; and (6) order. A complete elaboration of each item is beyond the scope of this discussion but may be found in Cogan (1967), pp. 75-82.

Thus, we arrive at the conclusion that at the present time the most profitable method of examining teacher competence is through measurement of the amount and type of verbal interaction between the teacher and the student. Probably one of the best available instrument for measuring verbal interaction was devised by Flanders (1963). The Flanders instrument which meets high standards of validity and reliability will be discussed in detail in Chapter III.

Relationship Between Interaction and Good Teaching

The relationship between interaction and good teaching has already been hinted at in the earlier discussion of good teaching. In fact, the discussion of good teaching required consideration of interaction, since interaction was considered to be an integral part of good teaching. The reader will recall that of the five major criteria available for evaluating teaching (student teaching grade, in-service rating, college grades, competent judges' ratings, and student growth) none have proven satisfactory. The reader will also recall that student growth is considered by most educators to be the most desirable method of evaluating teaching, but present data collection methods make it a tenuous proposition. Thus, the conclusion was reached that interaction between the teacher and his students was currently the closest a researcher could come to evaluating pupil growth.

Due to the earlier consideration of interaction in relation to good teaching, the balance of the present discussion will provide only a brief summary of the points discussed earlier. The present discussion will include additional commentary by several influential educators in both teacher education and educational psychology.

The question of verbal interaction can and should be viewed from two sides--the student, and the teacher. First, from the student's side, if one accepts the position that activity is a necessary pre-condition of learning, one must also accept the position that he must be both permitted and encouraged to be active. Second, if one accepts the above proposition, one must also accept the position that teachers must both permit and encourage verbal activity.

All the above can be accepted without judging the value of the verbal interaction to either party. The researcher recognizes this as a serious limitation on the investigation but feels such value judgments are more appropriately made by others on what is essentially a philosophical question with no ultimate answer.

Many educators are prepared to make judgments about the value of interaction per se without considering the actual content of the interaction. This is not to say these educators feel the content of teacher-student interaction is not important. Rather, these educators feel the interaction pattern itself is a critical part of the educational process. Educators who feel interaction per se should be examined exclusive of content support their opinion by citing learning theories that state student activity is essential to learning. They also support their opinion by citing child development theories which emphasize the social aspects of maturation. For example, Coombs (1965), a prominent teacher educator, states, "Children need to be given positive experiences of interaction with teachers" (p. 68). Brunner (1966), a curriculum specialist, reports, "Intellectual development depends on a systematic and contingent interaction between tutor and learner" (p. 6). Other writers in various areas including Perkins (1950), Jersild (1955), and Kelley (1947) offer similar statements in their respective writings.

Writers in psychology and personality development are also concerned with the necessity of interaction for healthy personality development. The following samples are representative of such authors. Maslow (1959) writes about "self-actualization" which results from successes and indicates many of these successes result from personal interaction. Symonds (1965) reports that active participation and practice by the learner are essential to the learning process. Cantor (1953) indicates the importance he attaches to interaction by titling one of his books The Teaching ↔ Learning Process.

Hypotheses

The preceding discussion generates the following hypotheses for testing. Identical hypotheses, stated in statistically testable form, will be found in Chapter III.

H_1: Student teachers receiving the simulation experience treatment will have a significantly higher mean score on the per cent of student talk than student teachers not receiving the treatment.

H_2: Student teachers receiving the simulation experience will have a higher mean score of student-initiated talk than student teachers not receiving the treatment.

H_3: Student teachers receiving the simulation experience will have a significantly lower main anxiety level on the post-test than student teachers not receiving the treatment.

H_4: Student teachers receiving the simulation experience will have a significantly higher term end rating by their respective Michigan State University student teaching Coordinators than student teachers not receiving the treatment.

H_5: Student teachers receiving the simulation experience will have a significantly higher mean score (indicating less concern) on their concern about discipline when they begin student teaching than student teachers not receiving the treatment.

H_6: Student teachers receiving the simulation experience will have a significantly higher mean score on a "self-concept as a teacher" instrument than student teachers not receiving the treatment.

Summary

The foregoing sections outlining the theory underlying the study have attempted to weave a framework for the study. Briefly, the researcher has attempted to relate three major concepts: anxiety, interaction, and good teaching/learning. The intent is to establish the relationships among these concepts and to support the hypotheses generated concerning anxiety and verbal interaction. It is also hoped that discussion of the connection between interaction and good teaching/learning supports the position that both anxiety and interaction are appropriate objects of fruitful research.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Simulation is a broad term used to describe a wide variety of activities. The term simulation had its earliest use in various branches of engineering, and more recently has spread to the military, business and industry, economics, and the social sciences, including education (Dawson, 1962). As would be expected, this wide range of simulation applications results in several different meanings for the term simulation, depending on the author's area of interest. For example, to an engineer, the term simulation usually means a physical model or mock-up used for design and test purposes. An engineer "simulates" the curvature of an airplane wing, or the water flow of a hydroelectric dam before constructing the real wing or dam. The armed services employ simulation in the form of "war games" to evaluate the ability of ships, planes, and ground troops to coordinate their activities. The armed services also use simulation for training new personnel. Business and industry use simulation to analyze potential markets for new products, and study manufacturing procedures. Business and industry also use simulation to teach management principles and acquaint new management staff with the specific characteristics of given industries. Education uses simulation primarily as an instructional device for teaching motor skills, facts and concepts (Dawson, 1962).

Since the present research uses simulation solely as an instructional device, the review of pertinent literature is restricted to applications of simulation for instructional purposes. There is a considerable volume of literature on use of simulation for instruction, but most report activities conducted by the military, business, and industry. Until recently, education has shown little interest in the application of simulation to instruction. Therefore, since the bulk of simulation literature available is outside the field of education, and education has generally looked to the military and business and industry when attempting to employ simulation (Dawson, 1962), the review of simulation literature is treated in three parts: (1) military, (2) business and industry, and (3) education.

Military Applications of Simulation

One of the first educational uses of simulation by the armed services was the development of the Link trainer for training of Air Force pilots. Edwin Link, a flight instructor, recognized the need for a safe and relatively inexpensive means for teaching aircraft control (Bushnell, 1962). The Link trainer evolved over a period of years and

and is now standard equipment for training both military and civilian pilots.

Considerable research has been done by the Air Force on the question of transfer of learning from Link's simulator to "real" situations. Adams (1962), reporting on transfer effects, came to the conclusion that transfer generally does not require high fidelity between the simulator and the "real" device. Fidelity in Adams' case meant the size and shape of the simulator and physical environment in which the trainee operates. For example, Adams concluded that in a pilot training simulator it is not necessary to recreate all the sights, sounds, and environmental conditions of an actual aircraft to teach most of the motor skills associated with flying.

Another use of simulation for training purposes was developed by Serle and Murry. Their Radar Navigation Trainer used motion pictures of radar scopes. These films were graded by level of difficulty to develop increasingly sophisticated interpretation of radar images (Adams, 1962). This simulator was tested in an experimental study involving three groups of subjects. One group received all motion picture simulation, a second group received half simulation and half actual air missions, and the third received all its training during air missions. No significant difference was found in the skills acquired by each group. The only difference noted was an opinion by group one that their manipulation skill on real equipment may have suffered. However, this opinion was not substantiated by the research.

When one considers the tremendous expense involved in air mission training, the results obtained in the radar navigation simulator are a clear indication of the efficiency sometimes available through simulation. Another advantage of both the pilot trainer and radar navigation trainer is the availability of the simulator experience at convenient times and places unhampered by logistics and inclement weather.

War gaming is a different type of simulation involving conceptual rather than physical models. These games range in size from a two person, board type game to complex military maneuvers practiced by thousands of men, ships, planes, etc., that participate in the North Atlantic Treaty Organization war games (Dawson, 1962). Chess is another war game that has been played ardently by military leaders for untold generations.

Other military uses of simulation include training in management and human relations. "Monogopologs" is a simulator used by the Air Force to simulate part of its supply system. This game consists of a supply depot and five two-wing air bases. The object of the game is to familiarize personnel with the Air Force supply system and have them experience typical management difficulties. The game simulates reality, but compresses time and space to allow the player to see quickly the probable results of his decisions (Renshaw and Heuston, 1960). Unlike some types of games, the ongoing decisions of the player are reflected in the nature and content of later play. This heightens the reality of the experience.

During the game of "Monogopologs" the player must maintain inventory control on the now famous "widget," a high value, reparable spare part, subject to random demand as it would be in a military supply system. He must consider lead time for procurement, cost, repair and replacement schedules and set inventory levels. At the end of the game he computes his score--the total cost of his actions (Renshaw and Heuston, 1960). Recently, this game has been adapted to business management by several management training institutions.

Human relations and personnel management have been simulated by the Systems Research Laboratory of the RAND Corporation. They recreated an air defense direction center using human beings. The entire environment of a center was simulated including physical layout, work assignments and tasks to be completed, and the cultural environment. During the course of the training the number and type of tasks assigned to members of the crew is a random variable as it would be under actual conditions. Also simulated are mechanical and electrical failures that affect operational status and efficiency.

Chapman (1965) reporting on the effectiveness of the air defense direction center simulator states:

> The members of each crew became an integral unit in which many interdependencies and coordinating skills developed. And each crew learned to perform more effectively. This learning showed itself in procedural shortcuts, reassignment of functions and increased motor skill to do the job faster and more accurately (p. 151).

Based on Chapman's results the Air Defense Command contracted with Systems Development Corporation of RAND for establishing such simulators for training all air defense crews throughout the world. More recently, this type of simulation has been expanded to other situations by all branches of the armed services.

The preceding review of simulation in the armed services reports only a few uses of simulation by the armed services. Each example was selected to represent a general classification of simulation for developing specific intellectual or motor skills for working together as a team, or for developing general management skills. In conclusion, the armed services were some of the earliest users of simulation and continue today as the largest single source of research, development and application of simulation.

Simulation in Business and Industry

Business and industry also use simulation to a limited degree in their training programs. The most predominant applications are in simulation of management and decision-making situations. The American Management Association

(AMA) has sponsored several symposia on management games for both pre-service and in-service training of managers (Newgarden, 1961). It is interesting to note that the AMA drew upon the earlier uses of simulation by the armed services by including many reports by representatives of the armed services. A typical report by Haythorn (1961) on the Logistical Supply Operation game (LP-2) discussed computer simulation of the maintenance and repair elements for an ICBM launch facility. LP-2 provided the model for several management games that are now available.

Kibbee (1961) at an AMA session took the position that simulation might mean different things to different people, but felt the terms simulation, game, and model were equivalent. Thus business and industry have tended to simulate primarily in the form of games. In fact, Greenlaw _et al_. (1962) define simulation as, "A sequential decision-making exercise structured around a model of a business operation, in which participants assume the role of managing the simulated operation" (p. 5). Another characteristic of business and industry simulation is the lack of controlled research on the effectiveness of the simulator. Much of the literature makes no reference to the value of the simulation, while some includes testimonials by the instructor or participants. Also, although there is considerable interest in simulation on the part of business and industry, few training programs use simulation for more than a small part of the total program (Greenlaw, et al., 1962).

Stewart (1961) has developed a classification scheme for the various types of business games. She identifies four distinct types of business games: (1) general management games; (2) functional games; (3) industry games; and (4) bureaucracy games.

General management games are characterized by interaction and competition between or among teams of players. That is, decisions by each team affect all other teams in the game and a winner is declared after a specified number of rounds of play.

Operation Suburbia, developed by Dr. Allen Zoll, is a general management game involving real estate (Greenlaw, et al., 1962). Each of five teams owns an equal amount of real estate at the beginning of the game and the object is to develop a real estate position superior to the opponents. To achieve this goal it is necessary to acquire land held by the other companies. Each team is given about fifty minutes to make transactions as it sees fit. Realism is attempted by providing each team with money, deeds, and option forms. At the conclusion of the game, each team is rated on success in establishing its position and the teams discuss actions and decisions made during play.

American Management Association's Top Management Decision Simulator is another popular competitive game.

This game can be adapted to a specific industry such as Carnegie Tech's detergent game which will be discussed later, or can be played with no specific product (Greenlaw, et al., 1962). In its general form, the game involves a single hypothetical product manufactured by several companies. Each company prices its product, and allocates its resources for production, marketing, research and development, inventory, and plant development.

Time is telescoped to encompass 15 to 20 years of operation in order to provide participants with experience in making and taking the consequences of long range ongoing decisions. As the game progresses, each team's results are plotted for later analysis and discussion by all participants.

Functional games simulate the carrying out of a specific function or role, generally at middle to lower management levels. Their purpose is to train managers for specific types of tasks common to a variety of industries. Marketing, personnel management, production, and quality control all make effective use of functional games.

Individual non-competitive functional games are also available. When a functional game is played individually, the player collects information and makes decisions that are judged against a predetermined standard of performance rather than against other players. Thus, even though a group of trainees may play the game simultaneously, there is no winner or loser. The In-Basket Problem simulator is a functional game in which an individual is confronted with a number of decision-making exercises.

Greenlaw et al. (1962) succinctly describe the In-Basket Problem game as follows:

> Each member of the training group, working individually, is usually given an hour to an hour and a half to study over the problem presented and to indicate in writing what action he wishes to take on each of his In-Basket items, together with his reasons for each decision (p. 10).

After the allotted time, the group gathers to discuss various individual decisions. Actions are analyzed by the total class or in "buzz groups" and probable consequences of such actions are considered. Greenlaw (1960) emphasizes the value of this simulation for stimulating discussion of management principles and concepts by providing specific concrete situations.

The Incident Process is a functional game created by Paul and Faith Pigors involving arbitration of labor cases and requires each trainee to commit himself to a specific course of action. The Incident Process begins with each trainee being given a brief description of an incident involving labor-management disagreement. The trainees as a group are then allowed to ask questions of the instructor for 30 to 40 minutes. The instructor has available additional information but presents it only upon direct request. Following the group session, each individual prepares a written cutline of the course of action he feels is most appropriate (Greenlaw, et al., 1962).

During a follow-up session, the various courses of action are discussed by the group but no attempt is made to rate the suggested actions. The Incident Process simulator experience is intended to develop an awareness of the need for acquiring sufficient information before a decision is made.

Industry games aimed at a specific industry represent the third category of business simulation. In industry games, a product or line of products, is selected as the content of the game. The purpose of industry games is to acquaint the player with some of the unique characteristics of the chosen industry. To add realism, actual parameter data from the industry is incorporated into the game.

The Dayton-Tire Simulator is a manually scored duel-market game in which participants make decisions on a quarterly basis concerning prices, expenditures, advertising, and bids for large volume tire contracts. Parameters of the game can be modified during or preceding the game to simulate a variety of markets. In this way, rare events that cannot feasibly be studied in the real world can be examined by each trainee (Greenlaw, 1959).

Kroger's Retail Marketing Game is used by that supermarket chain to train store managers. The game simulates a large retail market of the type owned by Kroger. Each prospective manager must make decisions on employing and scheduling personnel, general personnel management, customer services and relations, and community relations. Other variables include the amount and type of local advertising and stock display, general upkeep and appearance of the store and inventory control (Stewart, 1961).

Bureaucracy games are designed to give experience in organizational, human relations, and other internal management problems of a large organization. The object of these games is to simulate conditions requiring cooperation, communication, and division of labor for goal fulfillment (Stewart, 1961).

Carnegie Tech's Management Game is one example of a bureaucracy game, although it is played with a specific product and teams compete with each other as in functional and management games. The packaged detergent industry is the general setting, but since only three teams compete, it is not truly representative of an industry characterized by a multitude of producers. During the game each team finds it necessary to divide and share the workload. Team members must maintain constant and accurate communication with each other since actions of each member affect actions and decisions of teammates.

Cohen and Cyert (1965) report as follows on the effectiveness of this game:

> Active participation in the Carnegie game has proved to be useful training for future businessmen. Students playing the game are challenged to deal effectively with many of the same types of problems faced by real executives. The game helps students understand that decisions made in different functional areas and on different dates are interrelated, and it helps them realize that their organization and procedures for decision making have consequences for the quality of performance which results (p. 147).

The Travelers Insurance Company has developed a bureaucracy game that simulates the casualty insurance business. Four teams having four to eight members each compete for a larger share of the insurance business. The key to successful competition is full and complete cooperation and communication among the members of the team. Failure to cooperate and communicate clearly, quickly, and efficiently will penalize the team's position. Role positions for various management positions may be assigned by the instructor, determined by the team members, or developed as the game progresses. The complexity and range of data supplied to the team require team members to divide the workload and decisions. Emphasis is placed on the fact that decisions made by one team member will affect decisions being made by his fellow teammates. Thus, the essence of a large bureaucracy is simulated (Greenlaw, *et al.*, 1962).

The Travelers Insurance Company simulator requires a computer to receive, process and supply the vast amount of information and data used for each round of play. Although the literature generally refers to this type of game as being computer controlled, it is more correct to say the computer program controls play. The computer accepts, processes and presents data based solely on what is available in the computer program. Use of a computer in playing the insurance game has the advantage of requiring team players to prepare and present data in a form acceptable to the computer. Errors in data preparation or presentation will result in spurious information or considerable time delay just as would be encountered in an actual business operation employing a computer. Thus, trainees become accustomed to working with a computer, a skill they will almost certainly need in modern management (Greenlaw, et al., 1962).

In summary, business and industrial simulation owes its heritage to earlier work in the field of war gaming, operations research, and role playing. Games are the primary type of simulation and generally are designed around deterministic models containing a few chance elements. Evaluation of their effectiveness is generally subjective and in the form of testimonials expressed by instructors and game participants. It should be pointed out that games continue to represent only a small part of the total training program in most business and industry settings.

Simulation in Education

Until recently, simulation has received little attention in education. Lesser and Schueller commenting on this situation in 1966 state, "The reasons are not clear for the lack of use of simulation in education--a field to which these techniques should be especially well suited" (p. 34). Some authors, notably Greenlaw et al. (1962), suggest that educators have typically viewed simulation in the context of "games," and felt them inappropriate for the goals of education. Recently there has been more interest in educational simulation, but in some cases "simulation" is used to describe a traditional educational procedure such as role playing. Thus, the literature on educational simulation is replete with titles bearing the term simulation, which upon closer examination reveal acquisition of a new word to describe an old practice.

There are, however, several notable developments in educational simulation that will be reported in this section. Unfortunately, efforts to introduce simulation into education are usually not systematic, and each writer usually attempts to stake out what he considers new ground, rather than build on existing efforts.

Lesser and Schueller (1966) writing on the lack of adequate research on simulation in education state:

> Given both the scarcity and recency of media research, few replicated findings have as yet been accumulated. The absence of replication and cross-validation of results is perhaps the most conspicuous characteristic of media usage in teacher education (p. 321).

Due to the paucity of research literature on simulation in education, several simulation activities of general interest are reported along with the few specific references to research on educational simulation located by the researcher.

One of the most publicized simulations in education is the Whitman School Simulator project (Fredrickson, 1962). The simulator design was borrowed from industry and is essentially a management game. The Whitman simulator game is played individually and non-competitively. Each player's decisions are rated by the instructor. However, the purpose of the simulation is to provide trainees with an opportunity to role-play and experience the situations portrayed, rather than to provide a controlled evaluation of the trainees' performances.

The simulator presents Whitman School as a school in the hypothetical community of Jefferson. The participants, usually principals, play the role of principal of Whitman School. Participants prepare themselves for the simulator by studying written and tape-recorded materials and viewing a motion picture about the school. Participants must respond to a variety of problems using the "in-basket"--"out-basket" technique. Problems include student discipline, parent and community relations, and evaluation of probationary teachers. The simulation represents a full week of school operation with "out-basket" responses being scored daily by the instructor.

Fredrickson (1962) in evaluating the success of the simulator in a study involving several hundred principals reported:

> The simulation of a standard job in educational administration through the use of in-basket has proven to be successful as a method of collecting records of administrative performance which can be scored reliably, and yields scores which are useful in providing a better understanding of some of the dimensions of performance in such a situation (p. 134).

In a replication study, Immegart used the same simulator in eight universities during the summer of 1961. Unfortunately, this study was inadequately controlled and the findings are largely in the form of testimonials. The staff of the workshops concluded, "The simulation provided high motivation and interest plus instructional opportunities not usually found in traditional courses" (Immegart, 1962, p. 13).

Driver training simulators have been used for many years to teach "behind-the-wheel" driver education. Driving simulators had their origins in the Link pilot trainer described earlier. The trainee in the driving simulator views motion picture sequences to which he must react. To evaluate the trainees' performance, a score sheet automatically records the speed and correctness of his responses to the conditions portrayed on the screen. Several series of films are available depicting major driving functions, including turning, shifting, backing, parking, stopping, starting on hills, and expressway driving (Zaun and Schroeder, 1962). By using the simulator, driver training instructors are able to confront students with a variety of situations, such as snow or expressway driving which may not be available in the local area.

At the Teaching Research Division, Oregon State System of Higher Education, Kersh has simulated an entire classroom using a rear projection screen, film, a teacher's desk and a chalkboard. The films were produced from the teacher's vantage point and show an entire class of students. Various classroom problems previously identified by other researchers are depicted in the films. Each trainee is expected to respond verbally and physically. Based on these responses additional filmed episodes are shown depicting the probable outcomes of such responses. One serious limitation is that only a limited number of different responses are available in the feedback sequences. The effect of the simulation is measured by a post-test using another set of filmed problems.

In one Kersh study, four matched groups of 10 students each were assigned to experimental groups as follows:

Group 1	Large-Motion (Life size--motion picture)
Group 2	Small-Motion
Group 3	Large-Still (Life size--still photos)
Group 4	Small-Still

Kersh predicted that the Large-Motion group would show the greatest change, but found the Small-Motion group format to be most effective (Kersh, 1963). He concluded that the smaller size resulted in the subject being less involved, but this seems contrary to current learning theory. Kersh also concluded that the pre-test may have contaminated his design and resulted in spurious findings.

In a later study involving the same simulator, Kersh examined another variable--acting out vs. describing the response. He also changed the criterion variable from response to films to the supervising teacher's ratings during student teaching. Under these circumstances he found actual physical and verbal response to be more effective than only a verbal description of the response (Kersh, 1965).

Vlcek (1965), using the Kersh simulator at Michigan State University, investigated (1) simulation's effect on ability of student teachers to identify and resolve classroom problems, (2) the transfer value of simulation, and (3) the effect of simulation on self-confidence. Attitude toward the simulation experience was also examined. Employing a two factorial design Vlcek found the experimental group significantly better in coping with problem situations in test films. Later examination of classroom behavior indicated that experience gained in the simulator did not transfer to the trainee's student teaching. Other findings by Vlcek (1965) support the conclusion that simulation increases attempts to apply principles learned in the simulator. Vlcek also noted increased self-confidence on the part of his simulator trainees concerning their ability and preparedness to teach.

Bond (1965) also used the Kersh simulator in an attempt to change attitudes of education majors toward professional course objectives. Twenty (20) subjects spent 4 to 6 hours in the simulator and were compared to a matched control group. A pre-test post-test design using the semantic differential to measure attitude change found no significant difference between the two groups. Bond attributed this result to (1) high within-group variance, and (2) high initial positive attitude of all subjects, thus leaving little distance for positive change.

Cruickshank (1966) reported an uncontrolled study of simulation incorporating a decision-making technique. He simulated a 5th grade class using filmstrip, and various printed materials including a cumulative record on each child. Role playing and written accounts of decisions in addition to responses to film were the three types of activities required. No attempt was made to evaluate decisions but each subject was asked to project the probable consequences of his decision. A testimonial to the value of this simulation was presented, but no supporting evidence was offered.

In a recent development, Johnson (1967) has simulated a 4th grade class on the computer. He reports that a wide variety of class types can be generated such as predominately high or low I.Q., depending on the parameters desired. Thus he is able to simulate specific types of classes for teacher-trainees in special education or other specialized areas. Class characteristics can also be generated randomly to produce a more typical situation. To date his work has not extended beyond programing the variable desired. However, Johnson hopes eventually to use computer-generated class simulations with actual teacher-trainees.

Microteaching is another form of simulation receiving considerable attention in teacher-training programs. The format employed varies slightly from institution to institution, but the Stanford model, developed by Allen and Gross (1955), is a typical example. The Stanford simulation consists of having teacher-trainees teach a short (5-15 minute) lesson to a small (1-5) group of students. The lesson is video taped for immediate playback and discussion by the teacher and his supervisor. After the discussion, the trainee re-teaches the same lesson to a different small group attempting to improve on factors discussed in the critique. Commenting on the effectiveness of this procedure Allen and Gross (1955) report, "In most cases performance increases dramatically from the first microlesson to the second" (p. 26).

Cruickshank, et al. (1967) have simulated a ficticious fifth grade in which the participant assumes the role of the teacher. The simulation materials are divided into two units. The instructional unit includes sound filmstrips, motion pictures, role-playing cards, a simulation guide and printed material. The participation unit includes a curriculum handbook and audiovisual catalog, faculty handbook, student cumulative records, reading progress reports, sociograms and a workbook in which the participant records his responses.

The sound filmstrips in the Cruickshank simulator introduce the community and school, while the printed materials provide written descriptions of the problems and a selected bibliography. The motion picture films present eleven critical classroom incidents to which the participant must respond. The role playing cards provide the script for a problem involving several people such as the teacher, parent and administrator. Participants assume the various roles and play-act the scene. Cruickshank, et al. (1967) suggest that this role playing provides participants with insight into the motives and actions of other people and increases their empathic skill. Cruickshank, et al. (1967) provide no formal evaluation for their simulator, but note that the increased interest being shown in simulation indicates its value to users. Further, Cruickshank, et al. (1967) state, "A fundamental assumption of simulation training is that participants will react in much the same way in reality as they do in a simulated environment" (p. 5). However, no support is provided for this assumption.

In summary, education has made little use of simulation and a review of the literature indicates few systematic or cumulative investigations have been conducted. In education, the literature cited represents most of what is available, whereas in the military and business sections only representative samples are reported. Another weakness which characterizes much of the educational simulation literature is lack of rigorous evaluation of the effectiveness of the simulator. Specifically, education has used simulation to train public school principals, teach driver education, and help prepare school teachers. The single use of simulation most similar to the present research is the micro-teaching procedure using video tape recall of teaching performance.

CHAPTER III

DESIGN OF THE STUDY

Introduction

Chapter III presents a description of the simulator including its three main elements: (1) physical facilities, (2) films, and (3) recall workers. Also reported are the data collection instruments, data collection procedures, and type of data analysis. The experimental design is presented and several limitations of the present research are also considered.

Physical Facilities

A facility, originally designed and constructed by Kagan (1967) for research in counselor training, was modified to incorporate a motion picture projector and viewing screen. As adapted, then, the facility consisted of a small room equipped with two television cameras, a television monitor, two comfortable chairs, a motion picture projector and screen, and a small coffee table. The floor is carpeted to reduce extraneous sounds and help create a more personal atmosphere. The television cameras were partially concealed behind plywood panels perforated in a symmetrical pattern. Each subject was aware he was being video taped: no attempt was made to totally conceal the cameras, only to prevent the cameras from being a constant concern to the subject. Sound was picked up from a semi-concealed microphone near the subject. Again the purpose was not to deceive but only to minimize the effect of the microphone on the subject's reactions. The video tape recorder and split-screen generator were located in a nearby room. For a diagram of the facility see Appendix A. During the recording sessions it was necessary for an operator to monitor the recording and rewind the tape to the starting point as required. Once the playback had begun, however, the recorder was controlled by a remote stop-start device operated by the subject. For rerunning a given scene it was necessary to call the recorder operator to rewind the tape.

Films

The films used in the simulator were developed through the joint efforts of Dr. Norman Kagan and the researcher. They were produced specifically for the present research and related research currently being conducted by Dr. Kagan. Each of the 31 scenes depicts a high school student engaged in an activity usually interpreted by the viewer as either rejection or hostility clearly directed at the viewer. Dr. Kagan and the researcher arranged the scenes in what we considered to be in order of increasing intense hostility or rejection. However, the subjects did not always interpret the scenes in a similar manner. A range of stimulus situations was provided by using both male and female, black and white students on the film. Details on each scene appear in Appendix B.

Recall Workers

The recall worker first viewed the vignettes with each subject. Immediately afterward, they viewed the split-screen video tape playback of the subject and the scene in a playback session during which the recall worker encouraged the subject to stop the tape whenever he recalled a particular thought, feeling, or emotion. If the subject permitted the recording to run for a long while, the recall worker asked him to stop the tape and try to recall what he had been thinking. And if the subject passed over any particularly noticeable physical or verbal response, the recall worker asked him to stop and discuss it. The subject was also asked to project his probable handling of the situation based on what he was feeling and thinking. If he expressed dissatisfaction with his projected behavior, the subject was asked to suggest alternative methods of handling the situation. The recall worker made no attempt to evaluate reactions, but frequently asked the subject if he was satisfied with his own behavior, consistent with the experience of a classroom teacher who is seldom observed by his peers or superiors. The recall workers all received training in this technique: a training manual is available from Michigan State University. Each recall worker was a doctoral candidate in counseling with experience as a counselor.

The Treatment

The experimental treatment consisted of exposing each individual member of the experimental group to a series of 31 filmed vignettes and the accompanying recall sessions. The vignettes were divided into six individual reels to be used during six separate sessions, each of approximately one hour. The sessions were spread over several weeks.

Each filmed vignette presents a close-up view of a single high school student sitting at a school desk. The vignettes have separate filmed introductions telling the viewer where and when the scene occurs. For example, the viewer may be told that he is teaching a class and suddenly notices a particular student not paying attention, and then shown the picture. Each filmed scene, he is told, occurred either (1) in the viewer's own classroom while he was teaching, (2) in a study hall the viewer was supervising, or (3) after school in the viewer's classroom where he was alone with the student. Variations on the same theme are introduced by using male and female, and Negro and white high school students, since the reaction of the film viewer may vary considerably with the sex or race of the individual in the scene. The filmed episodes range in length between 10 seconds and two minutes. During the scene the actor on the screen is generally looking at the viewer, although in some scenes he is ignoring the viewer or trying to avoid him. When the filmed actor speaks, it is always directed toward the viewer; and in some cases he challenges the viewer or tries to involve him in a conversation. Each scene seeks to involve the film viewer emotionally, to have him react to what he is seeing. The film viewer is not expected to react physically, as in a role playing situation, although experience with the films indicates that observable physical responses such as body movement, arm and hand movement and facial expression do occur.

During the first session, the recall worker shows the scene to the subject and discusses the subject's reaction without the procedure being taped. This permits a less structured atmosphere and allows the subject and recall worker to become better acquainted. The first session is also used to orient the subject to the type of scenes being used and to encourage him to talk about his reactions. During the first session, the subject views seven different scenes allowing him many opportunities to express himself and experience the feeling of talking about his reactions to the recall worker. During subsequent sessions fewer films are used since the subject is encouraged to look beyond his initial reactions to the meanings behind them.

In the remaining five sessions the procedure differs from the first session. For while the subject and recall worker still view the film together, a video tape recorder operator is alerted and records the subject and the screen simultaneously using two television cameras. The signals from the two television cameras are fed into a split screen generator and recorded side by side in a vertically split image. Immediately after the film ends, the video recorder operator rewinds the tape to its original starting position and notifies the subject and recall worker. The split screen image of the subject and the film he was reacting to are played back through a monitor in the simulator. The playback may be stopped and started by a remote control device, which the subject operates to stop the tape whenever he recalls a specific feeling or idea. The recall worker encourages the subject to stop the recorder frequently, assuring him that this does not create more work for the television technician. The recall worker may ask the subject to stop the playback if he sees something the subject missed or feels the subject is deliberately avoiding something. Once a scene has been replayed, the next scene is usually begun. But if either the recall worker or subject wishes to view the scene again, the television technician is notified and again rewinds the tape for playback. During these sessions the recall worker is trying to teach the subject how to interrogate himself and gain insight into his own behavior. He encourages the subject to deal with basic or recurring fears and aspirations rather than linger over one or two responses or gestures which he may initially have chosen to discuss. The recall worker constantly seeks to cultivate the subject's own awareness of his behavior, and through this awareness to understand the motivation and belief system underlying his behavior.

Subjects vary greatly in their ability to engage in the recall process. But once the subject has successfully recalled some feelings, the recall worker broadens the area of recall, for example, by asking the subject to trace the origins of his feelings and of any changes that occurred while watching the film or video tape. The recall worker encourages the subject to talk about what he liked or disliked in his own behavior relative both to the films and to the recall worker. Gradually the recall session enters the realm of behavior change for the subject. Focusing the subject's desire for behavior change, the recall worker may ask "What do you want to feel toward me?" "What do you want me to think about you?" "How would you prefer to act toward the student you saw?" Although these last questions are generally the most difficult for the subject to handle, they seem to offer a fruitful avenue for recall (Kagan, et al., 1967).

Subject involvement in the recall process develops around:

1. His feelings: their origin and development within the recall session,
2. His thoughts: their origin and development within the interview,
3. The way he sees himself: the things he likes, dislikes, and fears about himself,
4. The way he would like to be seen,
5. The way he believes he is seen, and
6. The way he must change to be seen as he would like to be seen.

Kagan, et al. (1967) suggest that the subject moves during the recall session through four distinct stages:

1. The subject owns his discomfort.
2. The subject commits himself to change.
3. The subject differentiates stimuli.
4. The subject behaves differently. (Kagan, et al., 1967, p. 9).

During the first stage, the subject admits a feeling of discomfort and begins to specify the locus of his discomfort. The recall session permits the subject to see how he maintains the discomfort and the desirability of changing his behavior. In the second stage, the subject finds some motivation for changing himself from what he is into what he would like to be. At this point the subject cooperates with efforts designed to help him change, rather than resisting. As his defenses become self-evident, the subject must choose either to consciously continue these defenses, or to strive to change them. For as Kagan, et al. (1967) say of the effectiveness of the recall process, "IPR (the recall session) has been found to be a significant factor in facilitating client commitment to change" (p. 10). The subject who progresses through the first two stages next begins to differentiate more of the stimuli around him. The subject becomes more aware of his own emotions and the emotions of others, and he begins to examine his own expectations of others for discrepancies between these expectations and what he actually can observe. Examining these discrepancies leads eventually to the fourth stage of subject movement--different behavior. As the recall sessions continue, the subject becomes more able to evaluate his behaviors and their impact on himself and other people, at which point he becomes able to control and change his behavior, to recognize the consequences of his behavior and assume more responsibility.

The treatment consists, then, of three main elements: filmed vignettes, video tape replay, and recall with a trained recall worker. The recall process already found effective in counselor training (Kagan, et al., 1967) was here modified in film content alone to accommodate teacher trainees. While individual subjects are confronted with films which encourage them to simulate interpersonal relations, a video tape is made of the subject and played back for him in the presence of a recall worker, who helps the subject examine his reactions to the film. The specific goal of the recall sessions is to increase the subject's ability to analyze and evaluate his own behavior and its affect on other people.

The Population

The population for this research included all secondary education majors at Michigan State University who were enrolled in the secondary education methods course (ED 327) for fall term, 1968, and in student teaching for winter term, 1969. It was necessary for reasons of logistics to further restrict the population to include only student teachers assigned to one of five student teaching centers: (1) Detroit, (2) Walled Lake, (3) Birmingham, (4) Macomb, and (5) Lansing. The five centers selected represent a geographical spread of approximately 100 miles and include most types of schools and school districts. These five centers, furthermore, include the largest and the smallest centers, and account in all for over one-half of the student teachers in the class. The majority of the population were between 20 and 23 years of age, with several older. Approximately 15% are married, some with children. The population includes a slightly larger number of males than females.

The researcher feels that no characteristics of the population prevent generalizing the findings to all secondary education majors, particularly since all secondary majors must enroll for ED 327. Student teachers are assigned to the various centers on the basis of the availability of supervising teachers and the student's choice, criteria unrelated to the study. Since secondary education majors spend considerably less time in methods courses than elementary education majors (5 hours vs. 15 hours), and other factors may also be different, the findings should not be extended to elementary trainees.

The Sample

A random selection of 30 subjects were then randomly assigned to either a treatment or a control group, yielding two groups of 15 subjects. Participants in the treatment group were required to schedule six one-hour sessions with a recall worker at mutually agreeable times. (One subject originally selected for the treatment group was reassigned to the control group for personal reasons, and a replacement randomly selected from the control group was reassigned to the treatment group.) Of the 30 subjects selected, 13 were female and 17 were male. The treatment group included 7 women and 8 men, with 6 women and 9 men in the control group. The four major subject areas were represented as follows: Science--5 students, Mathematics--

8 students, Social Sciences--9 students, and English--8 students. The five student teaching centers were represented as follows: Birmingham--3 students, Walled Lake--2 students, Macomb--7 students, Detroit--5 students, and Lansing--13 students.

Instrumentation

Anxiety

Anxiety was measured twice during the experiment, in a pre-test and a post-test. The pre-test was administered as a mailed questionnaire to be completed privately by the subject. After completing the instrument, the subject returned the anxiety test in a stamped, self-addressed envelope provided. Subjects were assured anonymity and confidential treatment of their responses. The control group was contacted by mail for the post-test at the end of fall term. But, the experimental group was asked to complete the anxiety instrument after its sixth recall session, since completion date varied from subject to subject.

Both pre-tests and post-tests employed the IPAT Anxiety Scale (see Appendix C for examples of test items); the authors of the tests report re-tests after intervals of two weeks are not affected by the original administration (Cattell and Scheier, 1963). The IPAT Anxiety Scale consists of 40 questions distributed among five anxiety-measuring factors: (1) defective integration, (2) ego weakness, (3) suspiciousness, (4) guilt proneness, and (5) frustrative tension (Cattell and Scheier, 1963). Each question has three alternative answers, and all answers are marked directly on the test booklet. Responses are arranged so that left-right preferences cannot speciously affect anxiety score. This scale can be either individually or group administered, and takes about 10 minutes. The test booklet does not refer to anxiety, bearing the title "Self Analysis Form" to avoid awareness of the variable being measured. Examinees are instructed to answer all questions with their first responses. A single total anxiety score is computed based on all 40 questions. The test authors emphasize that, "This (the single score) is all that is recommended or needed in the majority of cases" (Cattell and Scheier, 1963, p. 10).

In a review of the IPAT Anxiety Scale, Cohen (1965) states that, "For a quick measure of anxiety level in literate adolescents and adults for screening purposes it has no peer" (p. 122). He also reports the instrument as having high reliability (.80 - .93) and high validity (.85 - .90). His closing statement includes this strong recommendation. "The IPAT Anxiety Scale's impressive systematic research background commends it for an overall measure. No competing test can compete in this regard" (Cohen, 1965, p. 122).

Classroom Interaction

Verbal interaction between the student teacher and his students was measured using an instrument created by Flanders (1963), which divides verbal classroom discourse into 10 categories (see Appendix D). Flanders originally developed and refined his interaction instruments in the years preceding 1963, and has not modified it since then, although others have done so for specific purposes. The original instrument has been used widely in research and general classroom observation since 1963 (Amidon and Hough, 1967). Its major strengths are the use of discrete, mutually exclusive and exhaustive categories, and the ease with which people may be trained to use it. Its major limitation is that it measures only verbal interaction. At the present time, several researchers are attempting to develop a corresponding non-verbal instrument, but none have proven satisfactory.

During the rating session, the interaction rater listens to the audio tape in a quiet place, preferably alone so that his scoring will not be affected by other people. At the end of each three second period, he decides which category best represents the communications events just completed. He writes this category number in a column while simultaneously assessing events in the next three second interval. He continues the process at the rate of approximately 20 observations per minute keeping his tempo as steady as possible. The numbers are written in a column to preserve the original sequence of events. It is generally considered necessary to make continuous observations for 30 minutes to obtain a reliable sample of the teacher's interaction pattern for that particular class period. The interaction sheet as completed by an interaction worker contains a large number of tally marks distributed among the ten categories. If the rater has maintained a constant tempo of one tally every three seconds, there should be approximately 600 tally marks for a 30 minute session. But consistency of tempo is more important than actual rate, since the tallies in each category are converted into a total number of seconds for each category in the data analysis. Six of these 30 minute observations taken at random should reliably identify the general interaction pattern of a particular teacher (Amidon and Hough, 1967). To further improve reliability, two raters may independently score each tape, a procedure generating two types of reliability. Inter-observer reliability may be calculated using a formula devised by Scott (Amidon and Hough, 1967), a measure of the agreement between raters. And Ebel (1951) has devised a formula for calculating pooled or sum reliability, suggesting it is a more appropriate measure than inter-observer reliability, when the pooled data is used in other data analysis.

Observations using the Flanders instrument may be done live or from audio tape. The present research used the latter method to reduce the effect of live observers on the classroom environment, and also to make more efficient use of the raters' time. Two raters were employed to independently rate each tape. The raters were "blinded" to the treatment to eliminate observer expectation. The raters selected for training and scoring were former teachers who are presently housewives. The raters were trained individually using a commercially available training kit developed by Amidon (1967). Before beginning the rating sessions, however, all raters were assembled to discuss the general ground rules to be followed to improve reliability. These ground rules, taken from Flanders (1967), pertain to ambiguous situations that may arise and cause disagreement as to interpretation and scoring.

1. When there is a choice of two or more acts in a three second time period, always record the act represented by the category most distant from category five, with the exception of category ten. This will maximize information by providing data in low frequency categories.

2. The trained observer is in the best position to judge whether the teacher is, in general, restricting or expanding the freedom of action of the students; if he feels that the pattern at the moment is restrictive, he is cautious in the use of direct categories; but he remains alert to a shift in momentary patterns by remaining alert to the total social situation.

3. When considering scoring of categories 8 and 9 (student response and student initiated talk) use the 9 only when you can answer the question, "How is the student showing his initiative?"

The ground rules may seem to invite biased observations, but no observer can be totally unbiased. As Flanders (1967) suggests,

> The observer is biased in the sense that his categorization must be consistent with his general assessment of the teacher's intent for a given sequence of action. He is unbiased in that he remains open to all evidence that the general intent of the teacher may be changing (p. 159).

The six 30 minute audio tapes were collected by a technician who had not been instructed in their intended use. He was told to place a battery-operated tape recorder in the student teacher's classroom according to a predetermined schedule. Before the class began, the technician turned the recorder on and left the classroom. At the end of the class he returned to pick up the recorder which had automatically shut off after about 35 minutes. Thirty (30) minutes of tape was analyzed, commencing when the bell rang indicating the class had started. All audio tapes were coded for identity by the technician to blind raters to the treatment.

In summary, it can be said that the Flanders Interaction Analysis Instrument does measure the verbal interaction of a teacher and his students. The instrument is fairly easy to use, and raters may be trained in a few hours. The extensive use of the Flanders technique in both research and general classroom observation support the position that it is the best interaction instrument currently available.

Success in Student Teaching

The term-end success rating scale used in the present study, originally developed by West (1968) at Michigan State University (see Appendix E), is divided into seven categories. The first six categories range from "One of the very best student teachers I have ever seen" as number one, to "Failed" as number six; the seventh category on the success scale marks those who drop student teaching or receive a grade postponement. The West instrument was developed for research purposes, since student teachers at Michigan State University receive no letter grade or grade point for student teaching, only a pass or fail grade for the entire experience. The student teaching coordinators were familiar with the West instrument having used it several times for other research projects.

The coordinators were requested not to attempt to determine which of their students had received the treatment and which were members of the control group. Unfortunately, the researcher could not control socialization over an entire term of student teaching, so contamination of coordinator ratings may have occurred. Another uncontrolled factor was how coordinators weighed each of the eight criteria suggested on the instrument; marked variance in the weights given the criterion variables would affect the comparability of coordinator ratings.

Self-Concept

To measure the self-concept held by student teachers concerning the ability to interact with students, the researcher devised a self-concept instrument employing Osgood's concept of a semantic differential. It was necessary to construct the specific instrument to be used. For as Osgood, et al., (1958) note:

> Although we often refer to the semantic differential as if it were some kind of "test" having some definite set of items and a specific score, this is not the case. . . . There are no standard concepts and no standard scales; rather, the concepts and scales used in a particular study depend upon the purposes of the research (p. 76).

The construction of an Osgood type semantic differential is based on establishing a "semantic space," divided into a continuum bounded by polar opposite adjectives through an origin or neutral position which divides the polar opposites. For convenience, the continuum is usually divided into seven categories ranging from high intensity in one direction, at one extreme, through a neutral position in the center, to high intensity in the opposite direction, at the other extreme. The person completing the instrument checks that category which best represents both the direction and intensity of his feelings. The seven categories are numbered 1 to 7, and a score is computed by summing the values of the spaces checked. A mean may then be computed by dividing the sum score by the number of scales.

To construct a semantic differential instrument, one must first identify several pairs of polar opposites associated with a single concept. For example, a series of continua based on one's opinion of himself as a person may be presented to the testee as one concept on the instrument, while one's opinion of himself as a teacher may provide a different locus of conceptualization. Only one concept--the subject as an interactor with students--is of interest in the present research, but a variety of concepts were introduced on the instrument to try to conceal the researcher's intent. A listing of the relevant concept and polar opposite scales used appears in Appendix F. Osgood, *et al.* (1958), point to some dimensions of semantic space, including evaluation, potency, activity, stability, tautness, novelty, and receptivity. But the evaluative dimension is by far the most important since it ". . . accounts for approximately half to three-quarters of the extractable variance" (Osgood, *et al.*, 1958, p. 72). And since the treatment in the present study seeks to improve self evaluation of "good" vs. "bad" teaching, the researcher chose to focus only on the evaluative dimension.

The self-concept instrument was administered during the first meeting of student teachers in each of the five centers at the beginning of winter term, 1969, easily disguised among the many forms routinely administered at this first meeting by the student teaching coordinator. All students at the meeting were asked to complete the self-concept instrument to help "plan for their needs." All completed forms were sent to the researcher who separated and destroyed the unwanted forms.

Concerns About Student Teaching

Previous studies by Triplett (1967) and others identified a number of concerns frequently expressed by student teachers. And Triplett (1967) devised an instrument listing 23 of the most common concerns of student teachers which asks them to rank their concerns numerically (see Appendix G). The Triplett list contains 16 items which are applicable to secondary student teachers, ranging from "planning instruction" to "maintaining effective working relationships with school personnel." Norms are available from Triplett's research, but the present study compared the ranks of the experimental and control groups to each other alone in order to determine inter-group differences. The specific item of most interest on the Triplett instrument is "handling classroom control" one of the focal points of the treatment for the experimental group.

Instructions for the "concerns of student teachers" instrument direct the subject to rank his concerns numerically, assigning the numeral 1 to the item of his greatest concern and the numeral 16 to the item of least concern. Composite rankings for each of the 16 items may then be computed for each group and compared. The instrument was administered during the first meeting of student teachers in each of the five centers at the beginning of winter term, 1969, easily disguised among the many other data collection instruments normally administered.

Preparation of Recall Workers

The five recall workers used in this study were all graduate students in counseling at Michigan State University who had had experience with the recall technique. Recall workers were selected from recommendations by Dr. Norman Kagan of the MSU Counseling Department. Since Dr. Kagan had already trained each of the recall workers previously for his research, no basic training was necessary. In order to standardize the format of the recall sessions, however, the researcher met with the recall workers for three one-hour sessions prior to their contact with the subjects. During the briefing sessions the recall workers, as a group, viewed the scenes to be used in the research. Following each scene, the recall workers discussed their own reactions to the scenes, and projected the probable reactions of the research subjects. Thus, the recall workers quickly became aware of a variety of possible responses to the films and could anticipate most types of reactions. Kagan, et al. (1967) indicate the importance of the recall worker being sensitive to a variety of reactions and not showing surprise or disapproval in response to the subject's reactions.

Although the recall workers' basic training preceded the present research, we shall describe the training procedure briefly. A complete discussion of training procedures for recall workers is available in a manual prepared by Dr. Norman Kagan at Michigan State University. First the new recall worker reviews the rationale, functions and techniques of the recall process. He then views a series of video tapes depicting recall sessions conducted by skilled recall workers, and is asked to identify places in the interview where he might encourage a subject to stop. He is asked why he chose that point, and what questions he might ask the subject. The recall trainee is taught to recognize such specific verbal and non-verbal cues emitted by the subject as shifts in body posture, changes in tone of voice, eye and head movements, and deliberate misinterpretations. The recall trainee is then video taped while he conducts actual recall sessions with subjects. He views these video tapes with his instructor and analyzes his performance. And following this critique, the trainee views a recall session conducted by a staff member with the same subject. Finally the recall trainee is paired with a second trainee as they act as recall workers for each other. The two trainees then discuss the joint recall sessions with a staff member.

Due to their other commitments, it was necessary for the recall workers to schedule sessions individually with their subjects. Each recall worker was given the names of three subjects and asked to contact them personally to arrange the six recall sessions. In a few instances, the recall worker and subject could find no mutually available time and the subject was referred to another recall worker. Once a schedule was established, each subject spent all six sessions with the same recall worker, considered an essential part of the treatment by Kagan, *et al.* (1967). The rapport established between the recall worker and subject accumulates across the sessions, encouraging the subject to be more candid in his responses. The dynamics of a counselor-client relationship are permitted to develop to the point where the content of previous sessions can be reviewed and re-evaluated in a variety of ways.

Preparation of Interaction Analysis Workers

In discussing the Flanders interaction instrument earlier in the chapter we mentioned that raters could be easily trained in a relatively short period of time. We also mentioned that the raters trained for the present research were former teachers who had left teaching to become housewives. The raters were trained using a commercially available kit of materials developed by

Amidon (1967). The kit consists of an audio tape, a description of the verbal interaction system, and a set of score sheets. The audio tape contains a series of short segments of verbal interaction in a variety of classrooms. The trainee listens to each segment while recording tallies on the score sheet. After each segment the trainee compares his tallies to a set of "correct" tallies that have been agreed on by a panel of expert judges. Any discrepancies are noted and an explanation is provided in the training manual.

During the training period for an interaction rater the length of the tape segment is gradually increased to provide the rater with experience in rating longer episodes. The trainee must develop skill in maintaining a consistent tempo of one observation for each three seconds. If necessary, the trainee may use a timer or other signaling device to indicate the three second intervals.

Following completion of the Amidon training kit the trainee raters were assembled as a group to discuss problems and differences of opinion related to interpretation of classroom incidents. The ground rules discussed earlier in conjunction with the Flanders instrument were discussed and mutually accepted. To provide additional practice, two additional 30 minute audio tapes were independently rated by all trainees. Following each tape the trainees compared their tally sheets and discussed differences of interpretation and scoring. No attempt was made to develop 100% agreement because of the variety of situations that can develop in a classroom. In fact, as Flanders (Amidon and Hough, 1967) warns, "No matter how extensive the training (of interaction workers) creative teachers will present sequences of behavior that raise new problems in categorization" (p. 160). Since the training period for the raters was completed in the two weeks prior to collection of the audio tapes in the present research, no refresher training was required before or during the research.

The Experimental Design

The experimental design for the present research incorporates a treatment group and a control group. Thirty (30) subjects were randomly selected and randomly assigned to provide two equal sized groups of 15 subjects. A pre-test/post-test design was employed to collect anxiety data, while post-tests alone were used to collect data on interaction, success in student teaching, self-concept, and concerns about student teaching. The treatment group received six hours of experience in a simulator as a substitute for certain outside class activities required of the control group. The following diagram reports the research design and the sequence of activities occurring during the research project.

Experimental Group	Pre-test 1. anxiety	Experimental Treatment	Post-test 1. anxiety 2. interaction 3. success in student teaching 4. self-concept 5. concerns in student teaching
Control Group	Pre-test 1. anxiety	Conventional Activities	Post-test 1. anxiety 2. interaction 3. success in student teaching 4. self-concept 5. concerns in student teaching

Statistical Hypotheses

To evaluate the effectiveness of the simulator experience and the underlying theoretical position relating anxiety to classroom interaction, six statistical hypotheses were generated and tested. Following accepted statistical procedure, each null hypotheses tested is presented first, followed by an accompanying alternate hypothesis.

Null Hypothesis$_1$:

> No difference will be found between the mean anxiety scores of the experimental and control groups as measured by the IPAT Anxiety post-test.
>
> Symbolically: $\overline{\mu}_T = \overline{\mu}_C$

Alternate Hypothesis$_1$:

Subjects receiving the experimental treatment will have a lower mean anxiety score on the anxiety post-test than subjects who did not receive the simulator experience.

Symbolically: $\bar{\mu}_T \neq \bar{\mu}_C$

Null Hypothesis$_2$:

No difference will be found between the mean amount of time classified as student-initiated talk of the experimental and control groups as measured by the Flanders interaction instrument.

Symbolically: $\bar{\mu}_T = \bar{\mu}_C$

Alternate Hypothesis$_2$:

Subjects receiving the experimental treatment will have a higher mean amount of time classified as student-initiated talk than subjects who did not receive the simulator experience.

Symbolically: $\bar{\mu}_T \neq \bar{\mu}_C$

Null Hypothesis$_3$:

No difference will be found between the mean amount of time classified as student talk of the experimental and control groups as measured by the Flanders interaction instrument.

Symbolically: $\bar{\mu}_T = \bar{\mu}_C$

Alternate Hypothesis$_3$:

Subjects receiving the experimental treatment will have a higher mean amount of time classified as student talk than subjects who did not receive the simulator experience.

Symbolically: $\bar{\mu}_T \neq \bar{\mu}_C$

Null Hypothesis$_4$:

No difference will be found between the mean term-end student teaching ratings of the experimental and control groups as measured by the West instrument.

Symbolically: $\bar{\mu}_T = \bar{\mu}_C$

Alternate Hypothesis$_4$:

Subjects receiving the experimental treatment will have a higher mean term-end rating than subjects who did not receive the simulator experience.

Symbolically: $\bar{\mu}_T \neq \bar{\mu}_C$

Null Hypothesis$_5$:

No difference will be found between the mean scores on concern about classroom discipline of the experimental and control groups as measured by the Triplett instrument.

Symbolically: $\bar{\mu}_T = \bar{\mu}_C$

Alternate Hypothesis$_5$:

Subjects receiving the experimental treatment will have a higher mean score (indicating less concern) on concern about discipline than subjects who did not receive the simulator experience.

Symbolically: $\bar{\mu}_T \neq \bar{\mu}_C$

Null Hypothesis$_6$:

No difference will be found between the mean scores on "self concept as a teacher" of the experimental and control groups on an instrument devised by the researcher.

Symbolically: $\bar{\mu}_T = \bar{\mu}_C$

Alternate Hypothesis$_6$:

> Subjects receiving the experimental treatment will have a higher mean score on "self concept as a teacher" than subjects who did not receive the simulator experience.
>
> Symbolically: $\overline{\mu}_T \neq \overline{\mu}_C$

Analysis of the Data

For each of the statistical hypotheses presented above, the test of significance is based on analysis of variance. Since the research paradigm includes a pre-test, analysis of covariance offers the most sensitive technique, providing there is a relatively high correlation between the pre-test and any of the several post-tests. The first procedure, therefore, was to compute a correlation coefficient for the pre-test and *each* of the post-tests. There is no predetermined size for the correlation coefficient in this situation, the key issue being whether inclusion of a correlation component reduces the size of the mean square error in the significance test. Kerlinger (1966) reports that the higher the correlation between the pre-test and post-test, the more effective the analysis of covariance. Kerlinger (1966) also suggests that correlations in the vicinity of .5 or higher will usually reduce error variance and improve the sensitivity of the statistical test: If the correlation is zero or quite low, analysis of covariance is a waste of time (p. 349).

An analysis of covariance may also be used to adjust initial differences in experimental groups. But since the groups in the present research were randomly selected and assigned, they were assumed equivalent prior to the treatment; therefore, the adjustment resulting from analysis of covariance is considered to account for differences based solely on the treatment. Note that analysis of covariance is appropriate for either large or small groups (McNemar 1962), an important consideration in the present study due to the small size of the sample (n=15, N=30). Analysis of covariance data should be antecedent to the treatment, and permits correlation of this antecedent data only with subsequent data (McNemar, 1962). In the present study, therefore, only the anxiety pre-test may be correlated with each of the post-tests; the post-tests may not be correlated with each other.

After computing and inspecting each correlation coefficient, a determination was made on the desirability of conducting an analysis of covariance. As pointed out earlier, there is no predetermined minimum size for the correlation coefficient in this procedure, so a minimum size of .40 was established, based on the theoretical position presented in Chapter I: that there is a correlation between anxiety and interaction. Another factor affecting the decision was the loss of one additional degree of freedom incurred in an analysis of covariance. With a group size of only 15 subjects, loss of even one degree of freedom has a magnified effect on the significance test.

Each of the statistical hypotheses was tested for significance using the "F" test of differences between means: this is the appropriate test regardless of the correlation coefficient reported above, since a sizeable correlation only affects the error term in the significance test. An alpha level of .05 was selected for rejecting the null hypothesis. But since the present research is exploring a new simulation technique, and the sample size is smaller than desirable, we shall report and discuss probability levels between .05 and .10 as indicating potential areas of future research.

Chapter IV reports the results of all correlation coefficients with their accompanying significance tests. Only dependent variables attaining the selected correlation level of .40 in relation with the pre-test are analyzed as an analysis of covariance; dependent variables not attaining the selected level of .40 are analyzed as a conventional analysis of variance.

Limitations of the Study

One of the serious limitations to the research design--which affects both the validity and generalizability of any findings--is the inability of the researcher to control for socialization between the experimental and control groups, and among subjects within each group, especially a problem since the present research was conducted over a six month period. The subjects had interacted for several hours per week in a special methods course prior to student teaching, and continued to meet during student teaching to discuss teaching methods, educational theory and philosophy and their own experiences as student teachers. While the researcher requested all research subjects not to discuss the nature or content of the research with their classmates, the efficacy of this request is not known.

A second limitation involves the possible effect of the pre-test on the experimental group. Although pre-test/post-test effects were controlled by administering the pre-test to both groups, the experimental group may have been sensitized to the treatment by the pre-test. Kerlinger (1966) reports that pre-test sensitization may be controlled by having two experimental groups, one receiving the pre-test the other receiving a placebo. But availability of facilities and resources prohibited a two-experimental group design in the present study. Kerlinger (1966) further suggests, however, that pre-test sensitization is not especially serious since anyone wishing to employ the treatment can render his subjects equivalent to the research subjects on this variable simply by administering the same pre-test.

A third limitation of the present study was inability to control for the Hawthorne effect. Subjects in the experimental group knew they were receiving a unique experience which their classmates were not. Considering the effect that research participation has been shown to have on subjects, probably the present research subjects also responded positively to the experiment over and above any improvement due to the treatment. The anxiety instrument findings may have been affected most since the research subjects knew that this tool was part of the research. The interaction data may not have been greatly affected since the subjects were unaware of how the audio tapes of their classes were to be analyzed. And since the self-concept and concerns about student teaching were collected as part of a seminar activity, the research subjects were unaware of their relation to the research project.

A fourth limitation is a sample N of 30. When the sample is assigned to two groups of 15, the probability of a statistical test being significant is reduced. The smaller sample size means any difference between the two groups has to be larger than is needed for a larger sample, in order to obtain significant results. It was necessary to restrict the sample due to the output capability of the simulator.

Three additional common design limitations should be considered not to have seriously affected the research findings. Maturation and any of a class of events generally labelled "history" were limited in their influence by having a control group which would have experienced similar events. And regression of test scores was controlled by a random sampling procedure.

We may certainly generalize the findings of the present study within the parameters of the original population, secondary education majors enrolled for a methods course fall term, 1968, and student teaching during winter term, 1969, at Michigan State University. However, the present findings should be further generalizible to undergraduate secondary education majors having educational experiences comparable to the population. Additional research would be required before one could safely generalize to other subject areas and other levels of educations.

Summary

A simulator was constructed consisting of 31 short motion picture vignettes, television cameras and video tape recorder, television monitor, and a recall worker. Each subject in the experimental group spent six one-hour sessions in the simulator viewing the films, watching a split-screen video tape replay of himself and the film clips, and discussing his thoughts, feelings, attitudes and emotions with the recall worker. The film clips depicted high school students either rejecting or acting hostile toward the viewer, and were arranged to depict increasing intensity of a given feeling over several scenes using male and female, and black and white high school students. During the individual recall sessions, each subject was asked to discuss his feelings toward the person on film and what feelings the filmed person was directing toward him. The split-screen video tape was played back to stimulate the subject's recall of what he had felt while watching the original film. Subjects were also asked to indicate how they would handle the filmed situations if they arose in the classroom. No attempt was made to evaluate the subject's problem solutions, but solutions inconsistent with beliefs expressed previously by the subject were called to his attention. Subjects were encouraged to discuss a variety of solutions until they found one with which they were satisfied.

The population consisted of secondary education majors at Michigan State University who were enrolled for a secondary methods course fall term, 1968, and did student teaching in one of five MSU regional centers winter term, 1969. A random sample of 30 students, 13 females and 17 males, was selected and randomly assigned to provide two equal sized groups of 15 subjects.

Five instruments were employed to collect data for the research. The IPAT Anxiety Scale was used as a pre-test/post-test measure of subject anxiety. The IPAT, which has high reliability (.80 - .93) and high validity (.85 - .90), provided a single total score of the subject's anxiety. Interaction between the student teacher and his students was measured using the Flanders Interaction Analysis system. This system employs ten discrete categories for teacher and student behavior, and requires the observer to record behavior every three seconds. Analysis of the observer's tallies over a 30 minute period provides a measure of the verbal interaction between the teacher and students. Success in student teaching was measured using a seven category scale developed by West for the Student Teaching Office at Michigan State University. West's success scale has been used in earlier research and was familiar to the people completing the form. The self-concept held by each student teacher was measured using an instrument constructed by the researcher. The self-concept instrument was based on Osgood's semantic differential, and employed several evaluative scales for the single concept of "myself as an interactor with students." Student teachers' concerns about student teaching were measured using a scale developed by Triplett which provides a list of common concerns of student teachers to be numerically ranked.

The recall workers used in the present research had been previously trained for similar research in counselor training. Each was a doctoral student in guidance and counseling and had had considerable field experience. The interaction analysis workers also had been trained earlier in using the Flanders system.

Data was analyzed by first computing a correlation coefficient between the anxiety pre-test and each of the post-tests. Correlations of .40 or greater were incorporated into an analysis of covariance to enhance the sensitivity of the significance test. If the correlation coefficient failed to reach .40, a conventional analysis of variance was computed. For both analysis of covariance and analysis of variance, significance was tested by the "F" test of difference between means. Six statistical hypotheses were generated and tested using the above procedure.

There are several limitations to the present study that affect its validity and generalizability. Socialization between subjects and groups was impossible to control over the six months involved in the study so contamination may have occurred; the effects are unknown. Another limitation was possible sensitization of the experimental group due to the pre-test. A third limitation was inability to control for the Hawthorne effect since it was obvious to the experimental group that they were participants in a research project. A fourth limitation was the small sample size necessitated by treatment complexity. The generalizability of the findings is limited due to population parameters: generalization is only permissible to secondary education majors having backgrounds similar to the population.

CHAPTER IV

FINDINGS

Findings

A compilation of the findings of the study are reported in this chapter. The effect of the simulation on anxiety level, self-concept, concerns about classroom control, classroom interaction, and success in student teaching of the subjects are individually considered. Although the research findings will be discussed in detail, conclusions based on the findings will be reported in Chapter V. It should be noted that the findings report data on only 28 of the original 30 subjects selected. The mortality of two subjects, one from each group, was due to failure to complete student teaching in one instance and induction into military service in the other.

The first hypothesis tested in the present study was:

> H_o1: No difference will be found between the mean anxiety scores of the experimental and control groups as measured by the IPAT Anxiety post-test.

The reader will recall that the experimental design called for administering the IPAT Anxiety Scale as a pre-test measure of anxiety level in addition to its use as a post-test. The purpose of the pre-test was to permit an analysis of covariance to increase the sensitivity of the data analysis. The first step in the analysis was to compute a correlation coefficient between the anxiety pre- and post-test. The correlation coefficient was .81 which is quite high, but expected, since the IPAT historically has had high reliability. However, at this point a disturbing situation arises. Examination of the IPAT pre-test data shows a considerable difference between the treatment and control groups. An analysis of variance computed on the pre-test data yields an F value of 6.39 which is significant beyond the .05 level for the appropriate degrees of freedom. The researcher is unable to explain the initial significant difference since the subjects were randomly selected and randomly assigned to groups. Also, equivalent pre-test data collection situations eliminate it as a source of bias. Apparently in the present study, randomness did not function to the extent of providing equivalent groups on the anxiety variable. This cannot however, be interpreted as meaning the groups are unequivalent on all variables. It is probable that although the groups are significantly different on the anxiety variable they are not significantly different on other variables. It should be pointed out that whenever random selection and assignment are employed, the researcher runs the risk of generating significantly different groups at the .05 level of significance. Apparently, in the present research the "rare event" has occurred by chance alone.

Although the treatment and control groups are significantly different on the anxiety pre-test, this initial difference may be accounted for in subsequent analysis by using covariance. It is interesting to note that the researcher had intended to use analysis of covariance solely to increase the sensitivity of the significance test, but under the present circumstances of non-equivalence, covariance may also be used to adjust for initial difference. The experimental group had a pre-test mean of 25.93 and a post-test mean of 25.29. The control group had a pre-test mean of 34.64 and a post-test mean of 36.00. Table 1 reports the necessary sum products and sum squares for calculating an analysis of covariance, as well as the adjusted sum squares and subsequent degrees of freedom. The "within" correlation coefficient is the correlation between the pre- and post-tests.

The analysis of covariance yields a value of 1.56 which is well below the critical value of 4.24 required for significance at the .05 level for 1 and 25 degrees of freedom. Again it should be pointed out that although there is a large difference in the post-test means of the experimental and control groups which would be significantly different beyond the .05 level in a simple analysis

TABLE 1.--Analysis of Covariance of the IPAT Pre- and Post-Tests of Anxiety for the Experimental and Control Groups.

	Total	Within	Between	F
Sum Products	3,028	2,374	654	1.56
Sum Squares X	4,076	3,273	804	--
Sum Squares Y	3,406	2,874	532	--
df	27	26	1	--
Correlation Coefficient	--	.81	--	--
Adjusted X^2	1,384	1,312	82	--
df	26	25	1	--

F = 4.24 at Alpha .05

of variance, the difference is explained by the significant difference on the pre-test. Thus, the only conclusion that can be drawn is that the null hypothesis may not be rejected, and that the simulation experience did not significantly affect the mean score of the experimental group compared to the control group.

The second and third hypotheses tested used data collected from six one-half hour audio tapes of all student teachers in both groups. The tapes were analyzed using a verbal interaction scale developed by Flanders (see Appendix D).

Two independent raters who were blinded to the identity of the experimental and control groups rated each tape and the resulting data was pooled to provide a single quantitative figure for each category. The reader will recall from a discussion in Chapter III that when data is pooled the most appropriate measure of interrater agreement is the sum reliability since the pooled data is used in other data analysis. Calculation of the pooled reliability of the raters yielded a value of .83 which is lower than the level achieved during rater training. This lower reliability is probably due to poorer sound fidelity on some of the actual tapes as compared to the training tapes which were recorded under optimum conditions. In some instance, the raters reported portions of the tapes were difficult to hear resulting in greater variability of scoring. A second source of lowered reliability is the ambiguity of some situations in the student teachers' classrooms. Such ambiguous situations do not occur on the training tapes. Two examples of such ambiguous situations are interruption of the student teacher by the supervising teacher and arrival of visitors to the classroom.

The second hypothesis tested was:

> H_o2: No difference will be found between the mean amount of time classified as student-initiated talk of the experimental and control groups as measured by the Flanders interaction instrument.

Computation of the correlation between student teacher scores on student-initiated talk and the IPAT anxiety pre-test resulted in a value of -.21. The size of the correlation coefficient indicates little or no relationship between the two variables. The results of the correlation dictated a simple analysis of variance rather than an analysis of covariance.

The mean scores on the student-initiated talk variable were 2.38 minutes per 30 minutes of tape for the experimental group, and 2.08 minutes per 30 minutes of tape for the control group. Table 2 reports the necessary sum squares, degrees of freedom and mean squares for computing the F test of significance. The resulting F value of 0.49 is well below the critical value necessary for significance at the .05 level of confidence. Thus, the null hypothesis of no difference between groups cannot be rejected.

TABLE 2.--Analysis of Variance for "Student-Initiated Talk" for the Experimental and Control Groups.

	Total	Within	Between	F
Sum Squares	34.31	33.68	0.63	0.49
df	27	26	1	--
Mean Squares	---	1.30	0.63	--

F = 4.22 at Alpha .05

Considerable additional data was generated in the other interaction categories but is not reported here since no rationale for doing so was established when building the theoretical structure for the present research. However, the reader may find in Appendix H the mean amount of time and corresponding per cent for each of the ten interaction categories for both the experimental and control groups.

The third hypothesis tested was:

> H_o3: No difference will be found between the mean amount of time classified as student talk of the experimental and control groups as measured by the Flanders instrument.

The correlation coefficient between scores on the IPAT Anxiety pre-test and those on the "student talk" portion of Flanders was -.12 indicating little or no relationship between the two variables. Again, the correlation results dictated a simple analysis of variance. The respective means for the experimental and control groups were 7.43 and 5.47 minutes per 30 minutes of tape.

Table 3 reports the necessary sum squares, degrees of freedom and mean squares for conducting an analysis of variance using the F test of significance. The resulting F value of 4.44 is greater than the critical value of 4.22 for significance at the .05 level of confidence. Therefore, the null hypothesis may be rejected and support inferred for the alternate hypothesis of a greater amount of student talk for the experimental group than the control group. Since rejection of the null hypothesis does not indicate the direction of the difference between groups, the group means must be examined for direction. The experimental group mean of 7.43 is greater than the control group mean of 5.47 supporting the directional hypothesis presented and discussed in Chapter III. Namely, that the simulation experience does increase classroom interaction between student teachers and their students.

TABLE 3.--Analysis of Variance for "Student Talk" for the Experimental and Control Groups.

	Total	Within	Between	F
Sum Squares	183.79	157.00	26.79	4.44
df	27	26	1	--
Mean Squares	--	6.04	26.79	--

F = 4.22 at Alpha .05.

The fourth hypothesis tested was:

H_o4: No difference will be found between the mean term-end student teaching ratings of the experimental and control groups as measured by the West instrument.

Data on success in student teaching was collected by requesting the Michigan State University student teaching Coordinators who observed and worked with the student teachers to rate the success of their respective student teachers. A seven point scale was used with the number one assigned to the very best student teachers through number six assigned to those who failed student teaching. The seventh category is reserved for students who fail to complete student teaching or receive an incomplete.

The experimental and control groups had mean term-end ratings of 2.43 and 2.92 respectively. The correlation coefficient for the relationship between the anxiety pretest and the term-end ratings was .18, indicating no relationship between pre-treatment anxiety and success in student teaching. The results of the correlation computation dictated a simple analysis of variance between means rather than an analysis of covariance.

TABLE 4.--Analysis of Variance for "Success in Student Teaching" for the Experimental and Control Groups.

	Total	Within	Between	F
Sum Squares	105.10	103.35	1.75	.44
df	27	26	1	--
Mean Squares	--	3.98	1.75	--

F = 4.22 at Alpha .05.

Table 4 reports the necessary sum squares, degrees of freedom and mean squares for conducting an analysis of variance and resulting F value for the success in student teaching data. The F value of 0.44 is well below the critical value of 4.22 necessary for rejection of the null hypothesis at the .05 level of confidence. Thus, the conclusion is drawn that the simulation experience did not significantly affect the success ratings of the experimental group and the null hypothesis may not be rejected.

The fifth hypothesis tested in the present study was:

> H_o5: No difference will be found between the mean scores on concern about classroom discipline of the experimental and control groups as measured by the Triplett instrument.

The reader will recall that subjects were asked to rank a series of items commonly identified as sources of concern by student teachers. The subjects were requested to rank items of greatest concern with low numbers and items of less concern with high numbers. However, in order to analyze the data it is necessary to transpose scores to correspond to the anxiety data. This is done simply by reassigning all scores such that low scores indicate low concern while high scores correspond to high concern. For example, an original score of 1 is transposed to 16 while an original score of 16 is transposed to 1. The single item examined in the present study is concern for classroom control. The experimental group had a mean score of 11.57 while the control group had a mean score of 10.64 on the classroom control item.

Computation of the correlation coefficient between the IPAT Anxiety pre-test and the concerns for classroom control yielded a value of .278 which is below the level selected for attempting an analysis of covariance. Therefore, a simple analysis of variance was computed using the F test of difference between means. Table 5 reports the means of the groups in addition to the sum squares, degrees of freedom and mean squares calculated in relation to the F test.

TABLE 5.--Analysis of Variance for "Concern for Classroom Control" for the Experimental and Control Groups.

	Total	Within	Between	F
Sum Squares	593	587	6	.265
df	27	26	1	--
Mean Squares	--	22.58	6	--

F = 4.22 at Alpha .05

The F value of .265 is well below the critical value of 4.22 required for significance at the .05 level of confidence. Thus it can be concluded that the null hypothesis of no difference between mean scores on concern for classroom control cannot be rejected. There was no significant difference between the concern regarding classroom control of the experimental and control groups.

The sixth hypothesis tested in the present study was:

> H_o6: No difference will be found between the mean scores on "self-concept as a teacher" of the experimental and control groups on an instrument devised by the researcher.

The mean score of the experimental group on the semantic differential type self-concept scale using the concept "myself as an interactor with my students" was 63.00. The control group had a mean score of 62.00 on the same instrument. Since the maximum possible score on the self-concept instrument was 70 and the minimum score was 10, it is apparent that both groups have relatively high self-concepts on the topic of interaction with students.

Computation of the correlation coefficient between the IPAT Anxiety pre-test and the self-concept scale was -.19 which is in an opposite direction to that predicted but is well below what is normally considered significant. The size and direction of the correlation coefficient dictated a simple analysis of variance rather than an analysis of covariance. Table 6 reports the means, sum squares, degrees of freedom and mean squares associated with the F test of the difference between means.

TABLE 6.--Analysis of Variance for "Self-Concept of Myself as an Interactor with my Students" for the Experimental and Control Groups.

	Total	Within	Between	F
Sum Squares	1,233	1,226	7	.148
df	27	26	1	--
Mean Squares	--	47.16	7	--

F = 4.22 at Alpha .05.

Since the F value is .148, well below the critical value of 4.22 at the appropriate degrees of freedom, the null hypothesis may not be rejected. Thus, there is no support for the hypothesis that the experimental group would have a significantly higher self-concept regarding interaction with students than the control group.

The subjects' attitude toward the simulator was not assessed directly by the researcher. However, several subjects in the experimental group of their own volition reported to the major instructor of the methods course that they felt the simulation experience was extremely valuable and should be a regular feature of the methods course. As a result of their actions, the methods course instructor invited the researcher to develop a program that could be used in a large group setting during the winter term. The researcher is of the opinion that such unsolicited action by the subjects is a more valid indication of their attitude toward the simulation than any researcher administered instrument.

Discussion of the Findings

The immediate post-test anxiety findings failed to reject the null hypothesis of no difference between the means of the experimental and control groups. Thus, there is no support for the hypothesis that simulation could lower anxiety. There are several possible explanations for the failure to reduce anxiety. First, the simulation experience may have had no effect on the subjects' anxiety level. This seems somewhat unlikely, since the films portray intense emotional situations.

Second, the reader will recall that the experimental group had a significantly lower score on the anxiety pre-test than the control group. This initial difference is unexplainable except on the basis of failure of the sampling procedure, because the subjects were randomly selected and assigned. Since the experimental group had a much lower initial anxiety level than the control group it is possible they were well below the mean of the population. If the experimental group was below the population mean, regression of scores would tend to move them toward the mean on the post-test. However, the experimental group moved even further away from the control group from a pre-test mean of 25.93 to a post-test mean of

25.29, while the control group was moving in the other direction from a pre-test mean of 34.64 to a post-test mean of 36.00. Therefore, it is possible that the simulation did have an effect but it was counteracted by a regression effect.

A third possible explanation for the lack of positive findings on the anxiety variable is also related to the initial non-equivalence of groups. If the experimental group was extremely atypical of the population and well below average in anxiety, it is possible they would not respond to the simulation, but that a more typical group would have responded.

A fourth possible explanation for the lack of difference on the anxiety scale is the lack of specificity of the IPAT Anxiety Scale. That is, the IPAT provides a general measure of both manifest and latent anxiety, but not specific anxieties associated with teaching. It is possible that if an instrument were available that could discriminate anxieties associated specifically with teaching, positive results would have been found since the simulator focused on anxieties in teaching situations. Currently no such instrument is available that meets high standards of reliability and validity.

A fifth possible explanation for the lack of difference is that a prospective student teacher's anxiety level is composed of numerous elements to which interacting with students contributes only a small portion. For example, the Student Teaching Coordinator and the supervising teacher may be much greater sources of anxiety to the student teacher than his students. The simulation experience presented only situations involving students. Lastly, the simulation may initially increase subject anxiety, but decrease it over several sessions. No data was collected for individual sessions, but it may be that adding additional sessions in the simulator and plotting anxiety over all sessions would result in a curvalinear relationship between anxiety level and number of - simulation sessions.

The two hypotheses dealing with the classroom interaction of the student teachers and their students provide an interesting contrast with each other. On the one hand, the student talk data, which is a combination of two categories--student response and student initiated talk--resulted in a significant difference between groups at the .05 level of confidence (4.44 versus a critical value of 4.24). But when the student initiated talk component of student talk is examined separately the resulting F test is far below the critical value at the .05 level (0.49 vs. 4.24). Thus, it appears that the second component of student talk--student response--is the source of difference between the experimental and control groups.

To test the above proposition that student response is the source of the difference between groups on the interaction data, an analysis of variance was conducted comparing only the student response portion for all subjects. Table 7 reports the sum squares, degrees of freedom and mean squares in addition to the resulting F value and critical F value at the .05 level.

TABLE 7.--Analysis of Variance for "Student Response" of the Experimental and Control Groups.

	Total	Within	Between	F
Sum Squares	89.08	74.84	14.24	4.94
df	27	26	1	--
Mean Squares	--	2.88	14.24	--

F = 4.24 at Alpha .05

The resulting F value of 4.94 is greater than the critical value of 4.24 indicating that student response is the major source of difference between the two groups on the interaction data. This finding of significant difference is somewhat suspect due to several factors to be discussed below. But the finding may also indicate a real difference between the two groups. Therefore, the following discussion is divided into two parts. First, several factors that cause the positive finding to be suspect will be considered followed by discussion of what the finding probably means if it is in fact valid. Final determination of the validity of the finding must await replication of the research.

One factor that could have artificially increased the F value beyond the selected alpha level is the variance between raters. The reader will recall that the inter-rater reliability was .83 which means the raters introduced a certain amount of variance because of their lack of total agreement. If the variance introduced by the ratings is systematically biased in the two interaction categories under consideration the finding is invalid. On the other hand, if the variance is randomly distributed across all categories its only effect is to inflate the error term and decrease the probability of a significant finding.

A second factor casting suspicion on the positive finding of greater interaction for the experimental group than the control group is the lack of other positive findings. If the findings relative to anxiety had been positive, or even close to the alpha level the positive finding on interaction would assume more credulence. The same argument can be made for the other factors examined including self-concept, concern for classroom control and success in student teaching. The finding of no difference between groups on the student-initiated interaction data is particularly troublesome, since we might expect an increase in student response talk to result in an increase in student-initiated talk. The writer will discuss shortly a possible interpretation for the positive finding for student response while simultaneously failing to reject the null hypothesis for student-initiated talk.

A third factor that could affect the validity of the interaction findings is the situation dimension of student teaching. Student teachers, due to their temporary placement for a relatively short period of time in a regular teacher's classroom, must operate in a constrained environment. Student teachers are not free to select the teaching style they would most prefer if it does not coincide with that of the supervising teacher. When one considers the fact that the student teacher is in the supervising teacher's classroom by invitation and knows he will be evaluated by the supervising teacher upon completing student teaching, it is not difficult to accept the position that his choice of teaching style is constrained.

A second set of situational elements affecting a student teacher's interaction pattern and general teaching style is the grade level and subject area taught. Earlier studies of interaction patterns across subject areas and grade levels consistently report marked differences especially across grade levels (Amidon and Hough, 1967). Without rigorously defining the situation it is impossible to specify the causes of interaction. However, when one rigorously defines all situational variables he loses the ability to generalize to the real world of the classroom. In the present study, the researcher selected the more general approach of randomly sampling teaching situations while foregoing an opportunity to examine interaction in a controlled situation. Thus, the researcher cannot definitely establish that the simulation caused the significant finding rather than some situational variable.

The preceding discussion indicated some possible invalidating factors relative to the positive finding of the experimental group having more interaction with their students than the control group. However, it is also possible that the positive finding is indeed valid. That is, there may be a real and significant difference between the two groups. The following discussion will provide an interpretation of the positive finding based on the assumption that it is valid.

A real and significant difference between the experimental and control groups can probably be attributed to the simulation experience if the factors considered above are eliminated. If the simulation was effective it would have the effect of "loosening up" the student teacher's classroom because he would feel more self confidence and less anxiety or concern for his interaction with people. The student teacher would also be more aware of the factors that affect human interaction and how he related to these factors. The apparent inconsistency between the anxiety finding of no difference and the interaction finding of significant difference may be explainable on the basis of an earlier discussion of the general rather than specific nature of the IPAT anxiety instrument. It may be that what the researcher has been calling anxiety and the anxiety measured by the IPAT are two different forms of anxiety. Everyone may have a general anxiety level about life in general, but quite different levels of anxiety regarding teaching a group of students. If this is true, reducing an individual's anxiety about teaching students would probably have little affect on his general anxiety level. To measure such specific anxiety would require development of instruments which are not available today. Another possibility may be that it is necessary to develop a new conceptual framework either exclusive of the term anxiety or making it only one element of the new concept.

A classroom in which there was a higher level of student response without a corresponding increase in student-initiated talk might be interpreted in several ways. First, it could be that the teacher is asking questions that are more broad and general in nature and require longer answers from the students. A question such as, "How did you arrive at your answer?" requires a much longer response than the question, "How much is 8 plus 6?" Yet both the above questions take approximately the same amount of time to ask. On the other hand, greater student response could also mean the teacher is asking many questions, each requiring only a short answer. Unfortunately, the instrument used to collect the interaction data does not report the type or number of questions. It only reports the amount of time required to ask the question. Therefore, any statements made regarding the type or quality of questions asked would be purely speculative. However, regardless of the type of questions being asked, if one assumes the positive finding relative to student response is valid, then one also assumes the classroom atmosphere for the experimental group was more permissive and less autocratic than for the control group. Greater student talk regardless of whether it is student response or student-initiated indicates the teacher is less suppressive and willing to allow the students to talk. A suppressive teacher probably would not permit students to give long, time-consuming answers fearing loss of absolute control over the situation.

Another possible interpretation for the significant finding on student response rather than on student-initiated talk is that the instrumentation did not adequately discriminate between the two types of student talk. Flanders (1963) also recognizes the difficulty in making a discrimination between when a student has completed the answer to a question and when he begins initiating additional talk. The reader will recall that in Chapter III the third ground rule for interaction raters was, "When considering scoring of categories 8 and 9 (student response and student-initiated talk) use the 9 only when you can answer the question, 'How is the student showing his initiative?'" Such a ground rule may systematically bias raters toward the 8 category and away from the 9 category. The effect of such a systematic bias would be to increase 8 and reduce 9 increasing the probability of significance for 8 while reducing it for 9. It also needs to be pointed out that the interaction workers on several occasions asked the researcher how to score given situations and the most common difficulty was making a discrimination between categories 8 and 9.

The main point of the preceding discussion seems to be that no definitive decision is possible on the validity of the significant difference finding. However, it seems apparent that the topic of simulation and its effect on interaction is worthy of additional research.

No support was found for the hypothesis that the experimental group would show less concern for maintaining classroom discipline than the control group. The experimental group had a mean score of 11.57 while the control group had a mean score of 10.64. The correlation between these means and the anxiety pre-test was .278 indicating little or no relation between anxiety and concern for maintaining classroom discipline. If one makes the assumption that student teachers ranked their concerns on the basis of their anxieties, then the IPAT did not discriminate the student teachers' anxiety since the rankings were almost identical. On the other hand, if one assumes the IPAT did discriminate real differences in anxiety then anxiety does not have an affect on ranking. The researcher prefers to explain the lack of correlation on the basis that the IPAT measures one type of anxiety (general) while the concerns instrument measures another type of anxiety (specific). If one accepts the latter explanation of different types of anxiety, the lack of correlation between the two measures is not surprising. However, regardless of the assumption one makes regarding different types of anxiety, there is only one conclusion that can be reached regarding the student teachers' concern for classroom discipline. The simulation did not result in the experimental group having less concern for classroom discipline than the control group. In retrospect, the researcher wishes he had a pre-test measure on the concerns instrument to perform a pre-post analysis.

The last hypothesis tested was based on the subjects' self-concepts of themselves as interactors with students. The experimental group had a mean score of 63.00 while the control group had a mean score of 62.00 on the self-concept scale. The correlation between the IPAT anxiety pre-test and the self-concept scale was -.19, and the F test value was .148. On the basis of the small negative correlation between the anxiety pre-test and the self-concept scale, it appears that anxiety is not related to self-perception of oneself as an interactor with students. Again in this situation it may be that general anxiety as measured by the IPAT is not related to interaction, whereas specific focused anxiety measures would have a high correlation with a student teacher's self-concept of himself as an interactor with students.

There are at least two possible explanations for the failure of the significance test to find a significant difference between the experimental and control groups on the self-concept scale. First, the most plausable explanation is that the simulation experience had no effect on the experimental group's self-concept of themselves as interactors with students. This conclusion seems reasonable since we can assume that the two groups were equivalent prior to the treatment and apparently remained equivalent following the treatment. Since no pre-treatment measure of self-concept was obtained, it is also possible the treatment did affect the experimental group's self-concept, but that a corresponding change also occurred in the control group as a result of other activities omitted for the experimental group.

A second possible explanation for the finding of no difference between the experimental and control groups on the self-concept scale lies in the data collection instrument. The semantic differential scale had a possible range of scores from 10 to 70. The reader will recall that the group means were 62.00 and 63.00 for the experimental and control groups respectively. This means the large majority of the student teachers in both groups had very high self-concepts of themselves as interactors with children. In fact, 5 out of 28 subjects received the maximum possible score of 70 on the data collection instrument. Since all subjects received scores near the extreme high end of the scale this left little room for further increase on the scale. Therefore, it is possible that the data collection instrument failed to discriminate real differences in self-concepts between the two groups.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The present research studied the effect of one type of simulation on the anxiety level, classroom interaction, success in student teaching, concern about classroom discipline and self-concept of student teachers. The simulation consisted of a series of motion picture films, split screen video tape recording and a trained recall worker. The 31 sound film vignettes portray high school students acting out various emotions directed toward the viewer. The emotions include (1) rejection of the viewer, (2) being rejected by the viewer, (3) hostility toward the viewer, and (4) receiving hostility from the viewer. The film scenes each contain a single high school student who may be black or white, male or female.

A split screen video tape recording is made of the experimental subject and the film scene he is watching, using two cameras and a semi-concealed microphone. Immediately following the film viewing session the video tape is rewound to its start and the recall worker and subject begin to watch the video tape playback. The playback is controlled by a remote stop-start switch operated by the subject. He is encouraged to stop the tape frequently and discuss his recalled thoughts, feelings and emotions with the recall worker who has been trained in the recall process.

A sample of 30 students was randomly selected from a 1968 fall term secondary methods course in the College of Education at Michigan State University, and randomly assigned to provide equal size experimental and control groups. The subjects in both groups were pre-tested on a standardized anxiety test prior to the beginning of the simulation experience for the experimental group. Since the six hours each experimental group member spent in the simulator was outside regular class time, he was released from some other methods course requirements at the discretion of his instructor.

Following the fall term simulation experience for the experimental group and the conventional activities for the control group an identical anxiety post-test was administered. At the beginning of winter term all subjects completed a self-concept instrument and a concern about classroom control scale disguised as routine data collection in a student teaching seminar required of all students. During the winter term while student teaching, all subjects were audio-taped on six different occasions for 30 minutes providing three hours of recordings for each subject. The tapes were collected over several weeks and in all classes the student teacher taught to provide a broad sample of each subject's teaching behavior.

The six audio tapes from each subject were rated by two scorers who were blinded to the identity of subjects by assigning code numbers to all tapes. The tapes were rated using an interaction scale developed by Flanders. The scale is divided into nine categories of teacher-student interaction with one additional category for silence, confusion and other unclassifiable events. A tally is recorded every three seconds to record the type of event occurring since the previous tally. The two raters' tallies were later summed for each category and converted to the corresponding amount of time.

The following six hypotheses were examined using either analysis of variance or analysis of covariance depending on the correlation of the data to the pre-test.

1. No difference will be found between the mean anxiety scores of the experimental and control groups as measured by the IPAT anxiety post-test.
2. No difference will be found between the mean amount of time classified as student-initiated talk of the experimental and control groups as measured by the Flanders interaction instrument.
3. No difference will be found between the mean amount of time classified as student talk of the experimental and control groups as measured by the Flanders interaction instrument.
4. No difference will be found between the mean term-end student teaching ratings of the experimental and control groups as measured by the West instrument.

5. No difference will be found between the mean scores on concern about classroom discipline of the experimental and control groups as measured by the Triplett instrument.

6. No difference will be found between the mean scores on "self-concept as a teacher" of the experimental and control groups on an instrument devised by the researcher.

Several difficulties were encountered during the research including the mortality of two subjects from the original sample. The reduced sample size of 14 subjects per group diminished an already smaller than desirable sample by almost 5%. A second difficulty encountered was poor sound quality on some of the audio tapes. The poor sound quality make it difficult for raters to score some tapes and contributed to an inter-scorer sum reliability of .83 which is lower than desirable. A third difficulty centered on analyzing situations which occasionally arose in the classes being taped. When the supervising teacher interrupts the student teacher, or the principal makes an extended announcement on the public address system, the interaction between student teacher and his students suffers. A fourth difficulty encountered was a significant difference between the experimental and control groups on the anxiety pre-test. Due to random selection and assignment to groups, and identical test conditions, the difference could only be attributed to a failure of randomization to provide equivalent groups on the anxiety variable. And lastly, the two categories of student talk--student response and student initiated talk--are sometimes difficult to discriminate from each other. This is primarily a problem of discriminating when a student has completed his response to the teacher's question, and when he begins to initiate additional talk. The raters experienced some difficulty in making such decisions.

The findings for all but one hypothesis would not permit rejection of the null hypotheses. The single exception was the hypothesis relative to student talk. The null hypothesis was rejected beyond the .05 level of confidence inferring support for the hypothesis that exposure of student teachers to the simulation experience increases the amount of student talk in their classes. The single positive finding is suspect since no other directional hypotheses were supported. However, no definite decision regarding the validity of the finding can be made without additional research to confirm or contradict the present finding.

The anxiety hypothesis of no difference was not rejected, thus finding no support for the hypothesis that the simulation experience decreases anxiety. Several possible explanations for failing to reject the null hypothesis were presented including the lack of specificity of the anxiety instrument employed, and the significant difference of the two groups on the anxiety pre-test.

Rejection of the null hypothesis relative to the student teachers' self concepts of themselves as interactors with students was not possible. The failure to reject the null hypothesis may have been due to the simulation having no effect on self-concept, or may have been due to the data collection instrument. Both groups scored near the maximum possible score leaving little additional semantic space for movement on the scale.

Concern for classroom discipline was also measured, but again the null hypothesis could not be rejected. Both groups showed approximately the same amount of concern for classroom discipline indicating the simulation experience was not effective in reducing concern for classroom control. Analysis of the success ratings assigned by student teaching coordinators resulted in no difference between the groups. Thus the only conclusion seems to be that the simulation did not significantly affect the success of the experimental group compared to the control group.

Of the two hypotheses tested using classroom interaction as the variable only one was rejected. As was indicated earlier the only directional hypothesis supported was that the simulation experience would increase student talk. However, its companion hypothesis that student-initiated talk, which is a component of student talk, would be increased was not supported. A full discussion of several possible interpretations of these seemingly contradictory findings is presented in Chapter IV with the main points being: (1) the positive finding of difference is suspect, (2) the student response element of the student talk category is the source of the significant difference, (3) student response by itself is also a measure of the permissiveness of a teacher, and (4) no final determination of the validity of the findings is presently possible.

No data was collected concerning subject attitude towards the simulation experience. However, following the fall term experience in the simulator several subjects in the experimental group of their own volition reported to the education methods course instructor that they felt the simulation was very valuable and should be a regular part of the methods course for all students.

Conclusions

Several conclusions are made from the findings summarized above.

1. The simulation experience did not lower the general anxiety level of student teachers as measured by the IPAT anxiety test. A more specific anxiety test focused directly on teacher anxiety in the classroom may or may not produce similar findings.

2. Student talk as measured by the Flanders interaction system did increase in the classrooms of student

teachers who had the simulation experience. The exact cause of the increase is however unknown.

3. Student-initiated talk as measured by the Flanders interaction system did not increase in the classrooms of student teachers who had the simulation experience.

4. The simulation experience did not lower the concern for classroom discipline of student teachers as measured by the Triplett instrument.

5. The simulation experience did not increase the success rating assigned to student teachers by their student teaching coordinators.

6. Self-concept as measured by an instrument designed by the researcher did not increase from having the simulation experience.

7. Some subjects had such a favorable attitude toward the simulation experience that they reported favorable comments to the methods course instructor.

Implications for Future Research

Since the present research explores a new type of simulation, the study should be replicated to provide a second independent set of findings. Also, studies should be conducted to study the three components (films, recall worker and video tape) of the simulator; both individually and in pairs. For example the films might be employed by a recall worker without using video tape or the films and video tape might be employed without a recall worker.

Another dimension of the simulation situation that should be studied is the effect of having two or more subjects view the scenes simultaneously and discuss their reactions among themselves as well as with the recall worker.

Other possible research would include developing films along the sex dimension. Kagan (1967) had identified the sex dimension as having two directions. First, the viewer is the object of sexual interest of the actor on the film. And second, the film actor is reacting to the sexual interest of the viewer. On the basis of Kagan's (1967) findings concerning the effect of sexuality on interpersonal relations in counselor training, it seems reasonable to hypothesize a similar effect on teacher trainees.

Future research on the type of simulation employed in the present study should also be conducted using experienced teachers as subjects. It may be that the larger experiential background possessed by such teachers would be conducive to better discussions with the recall worker and more insight into personal as well as student motivation. Also, the experienced teacher, if currently teaching, would be able to study the model of his interpersonal interaction in the simulator and immediately practice any proposed changes in his classroom. Further, it seems quite possible that the experienced teacher would be more strongly motivated than a teacher trainee to change his interpersonal interaction characteristics in that he could more readily sense the value of such changes.

The present study requires replication to eliminate methodological flaws. First, the original sample size of 30 and the subsequent loss of two subjects provided a smaller than desirable sample. Second, for some unknown reason the sampling procedure did not provide equivalent groups on the anxiety pre-test. Replication of the study would probably eliminate this problem. Third, the extended period of time between commencement of the experimental treatment and completion of the data collection provided considerable opportunity for socialization within and between groups. Better control of the socialization problem would be desirable. Fourth, the research subjects were aware that the anxiety pre- and post-tests and the classroom taping were associated with the present research. Disguising either or both activities would strengthen the research design.

In replicating the present research the researcher would suggest the following modifications in attempting to avoid several problems encountered. The lack of equivalent groups on the anxiety pre-test could be avoided by scoring the pre-test immediately following its administration. The pre-test scores for both groups could then be analyzed for differences; were differences found to exist on the pre-test, the sample could be discarded and a new sample selected and similarly examined. Also, a larger sample would greatly reduce the probability of nonequivalence on the pre-test.

Another problem deserving attention when replicating the present research is the poor sound quality on some audio tapes. Higher fidelity audio recorders equipped with more sensitive microphones should improve sound quality. The researcher noticed that of the variety of audio recorders employed, the larger more expensive instruments usually produced better quality tapes. Recorder placement in the classroom also requires careful attention. When recorders are placed near air circulation units, background noise level is increased with a corresponding decrease in the intelligibility of the verbal interaction between the teacher and students.

Higher inter-scorer agreement might also be achieved by having the two interaction raters listen to the tape simultaneously. Then, if a question arose in either rater's mind, the tape could be stopped and the question resolved. In this manner, variance caused by scorer disagreement would be reduced or eliminated.

Socialization between groups and among subjects might be better controlled in any replication by reducing the time required for the research. If for example, the simulation experience was administered only a few days, rather than several weeks, prior to student teaching, opportunities for socialization would be reduced. Another method of reducing socialization between groups would be to assign only experimental or control group subjects to the student teaching centers. However, this would completely eliminate random sample selection.

The present research findings are generalizable only to teacher trainees at the secondary level in the areas of math, science, English, social studies, and industrial arts. Additional research is needed to examine the effect of the present simulation on teacher trainees in other secondary subject areas as well as trainees in elementary education.

The question of presenting the stimulus situations on film should also be researched. One variable is audio versus audio and visual presentation of the scene. A second variable is the view of the actor on the film. In the present research the viewer sees only the upper half of the film actor who is looking directly at the viewer. The effect of seeing the entire actor either alone or in a group should be studied. A related variable is the setting in which the scene occurs. In the present research the actor is seen alone against a neutral gray background. Staging the scene in an actual classroom may affect the reaction of the viewer.

The video tape feedback component of the simulator should also be studied. The present research employed a split screen playback of the subject and the film he was watching. A two group study of split screen versus only the image of the subject would indicate the desirability of a split screen system.

The present study again calls to attention the problem of evaluating teacher success. The reader will recall that in the earlier discussion of what is good teaching the researcher reported considerable disagreement among educators as to what constituted good teaching. Thus the present research findings based on classroom interaction will not be universally accepted. Until educators can generally agree as to what constitutes good teaching, the value of the present simulation and all other teacher training procedures can never be satisfactorily evaluated.

The question of specific versus general anxiety also needs considerable examination. The entire question of varying anxiety levels for specific situations may require development of new terminology for describing situational anxiety. In fact a whole new conceptual framework may be required including among others the concepts of self, other, and the social and contextual situation in which human interaction occurs. New instrumentation for measuring specific situational anxiety also needs to be developed for further evaluation of the efficacy of the simulation used in the present research. Such instrumentation needs to be focused directly on the teacher-student interface and not on the more general context of the teacher as a person.

The reader is cautioned however to keep in mind that anxiety is not, and should not be, the primary focus of future research involving the simulator used in this research. While anxiety has been discussed as a useful theoretical construct for establishing a link between teacher behavior and student learning, the ultimate goal of course is optimum student learning. To attempt arbitrarily to demonstrate a link between teacher anxiety and student learning could seriously diminish the value of future simulation research. It may be that other psychological or sociological variables would provide more fruitful areas of research in attempting to build an adequate theoretical structure.

The reader is also reminded that simulation, even if demonstrated to be highly effective, is only one of many educational experiences. Past experience in education has always pointed to the fact that a variety of materials and techniques are required. Establishing a balance among many different teaching and learning activities will always be necessary for producing well-rounded, competent students.

It becomes apparent from the questions raised above that educational simulation is still in its infancy and there are more questions than answers. Although at the present time considerable research is being conducted in the area of educational simulation, the large number of interacting variables which affect the results indicate the issue of simulation effectiveness will not be completely resolved in the near future. This should not discourage those considering conducting research in the area, but should forewarn them of the complexity of such research.

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APPENDICES

APPENDIX A

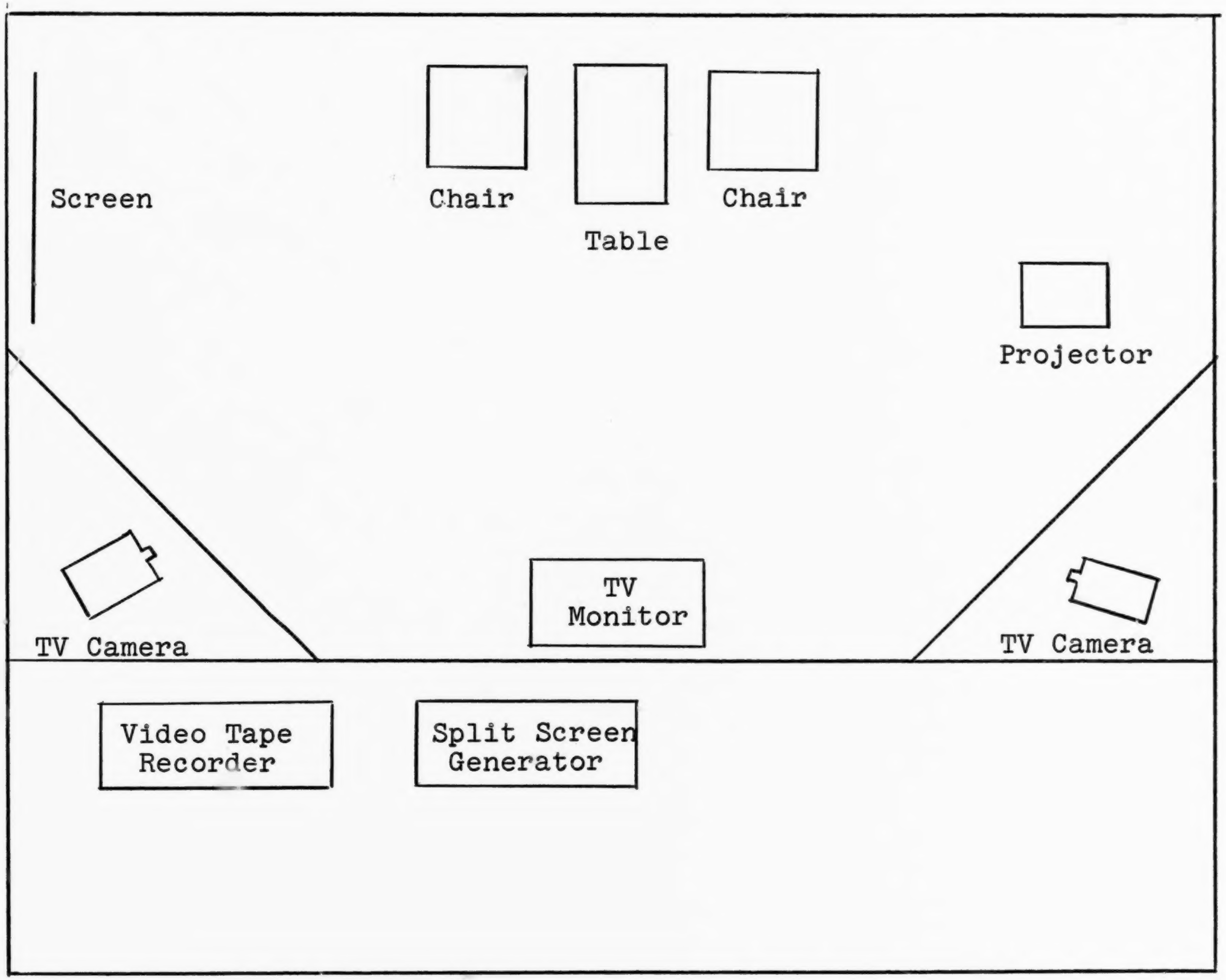
Screen
Chair
Table
Chair
Projector
TV Camera
TV Monitor
TV Camera
Video Tape Recorder
Split Screen Generator

DIAGRAM OF THE SIMULATOR

APPENDIX B

APPENDIX B

Since several of the filmed vignettes are silent, and the scripts for many of the sound vignettes would be misleading without the accompanying gestures and inflections, descriptions of the vignettes are provided rather than the actual script. The filmed introductory statement for each scene is reported verbatim. All scenes are in black and white on 16 mm motion picture film, using male, female, black and white high school students.

General Introduction

"I'm Norman Kagan. The film you're going to see grew out of research here at Michigan State University. Teachers especially have found it very helpful. The film consists of individual vignettes. In each vignette a student will look directly at you and attempt to engage you in a relationship. Our purpose in doing this is to try to help you remember the kinds of thoughts and feelings you have in relating to students. Try to make each scene as real as possible for you. Try to imagine you're alone with each of the students you're going to see. At the end of each vignette, we will ask you to share your thoughts and feelings with us. What kinds of things went through your mind? What did you think? What else do you think of these thoughts? What else do you think? What kind of feeling did you have? What was your body doing? Were you tense? Were you relaxed? and so on. When else do you feel this way? When you have these kinds of thoughts and feelings, what do you typically do? How do you typically respond? When you have these kinds of thoughts and feelings, how do you wish you could respond if this is not the way you typically do respond? Can you share these with us at the end of each scene?"

Scene 1

Introduction:

"In this scene, imagine that you're in front of your classroom. You're talking to the students. As you talk, your attention focuses on one student."

Vignette:

(Male--White) The boy is digging on his desk with a nail file with an occasional furtive glance at the viewer.

Scene 2

Introduction:

"You continue with your lesson but again your attention focuses on the same student. By now he seems to be aware that you have recognized his behavior."

Vignette:

(Male-White) Same boy as scene 1. He is now aware the viewer is watching him and is deliberately acting bored.

Scene 3

Introduction:

"You take a moment and very quickly convey to the student your disapproval of his behavior. He's caught the message. But as you look away, out of the corner of your eye, you notice him."

Vignette:

(Male-White) Same boy as scenes 1 and 2. Starts to make an obscene gesture at the viewer, but is caught before actually doing so. He denies he was doing anything.

Scene 4

Introduction:

"You're in front of your classroom talking with the students. You notice one student."

Vignette:

(Male-Black) He closes his book, takes several spools out of his pocket, and begins to play with them on his desk.

Scene 5

Introduction:

"You continue talking with the students. But again your attention focuses on this one student. He is aware this time that you are looking at him."

Vignette:

(Male-Black) Same boy as scene 4. Leans back in his chair and rocks back and forth. Several times he half conceals a smile or smirk while looking at the viewer.

Scene 6

Introduction:

"You've given the class an assignment. While they are working at it you're working at your desk. You look up to notice that one student has his head down. What's the matter you ask?"

Vignette:

(Male-Black) Same boy as scenes 4 and 5 responds to question saying he does not have a pencil. A hand appears and gives him a pencil which after several seconds he deliberately breaks in half while looking directly at the viewer.

Scene 7

Introduction:

"You reprimand one student severely. Apparently this has been very embarrassing for her in front of the students. She responds."

Vignette:

(Female-White) Looks at viewer and in a vicious and biting way says she would like to "scratch your eyes out." She continues with the same theme in several varying repetitions ending with a swear at the viewer.

Scene 8

Introduction:

"You are introducing a new topic. You have very carefully selected some materials. You very much want the students to become excited, intrigued with the ideas and material you are presenting to them. Your eye catches one student in the back of the room."

Vignette:

(Female-Black) The girl ignores the viewer while loudly chewing on a large wad of gum. Later she pulls the gum between her teeth and makes loud smacking noises as she puts it back in her mouth.

Scene 9

Introduction:

"You reprimand one student severely. You're furious. She responds."

Vignette:

(Female-Black) The same girl as scene 8 points her finger at the viewer and repeats several times that the viewer is going to "get it." The "it" is unspecified.

Scene 10

Introduction:

"You are supervising students during an activity period. One boy's project requires the use of spray paint. You observe him and notice that he seems to be getting a bit restless and so you slowly approach him. He is unaware that you have noticed him and he's unaware that you are walking toward him."

Vignette:

(Male-White) The boy turns the paint can to the side and sprays--presumably at another student. Suddenly he turns and looks at the viewer recognizing he has been caught in the act. After a slight hesitation he lifts the spray can and sprays paint directly at the viewer.

Scene 11

Introduction:

"One student has been disruptive and deliberately in violation of school and classroom rules. You tell him that he'd better cut it out or else."

Vignette:

(Male-Black) He looks at the viewer and dares him to do anything about it. The general theme is repeated several times.

Scene 12

Introduction:

"For some time one student has been a source of irritation to you. Finally you scold her telling her that she has been a distraction and a disruption for the class and you. She responds."

Vignette:

(Female-Black) The girl leans back and says, "What's the matter, do I bug ya?" Later she states, "I'm going to keep on bugging ya too, and bugging ya, and bugging ya."

Scene 13

Introduction:

"You've asked one of your students to stay after class. You ask her why she seems to enjoy being a constant source of irritation to you. She answers you."

Vignette:

(Female-Black) In a hostile voice she states, "I hate you because of what you're thinking about me. You don't say them, but I know you're thinking them."

Scene 14

Introduction:

"You ask the student why she thinks you kept her after school. She responds."

Vignette:

(Female-Black) While slowly looking the viewer up and down, she says in a knowing voice, "I know why you kept me after school."

Scene 15

Introduction:

"You've been having some difficulties with the students in your class. You just don't understand what's been going on. You ask one student, with whom you seem to get along, to stay after class and chat with you. You explain to him that somehow you're just not hitting it off with the students. You ask him if he can help you understand what's going on."

Vignette:

(Male-Black) While looking the viewer directly in the eyes the boy says the viewer is a phoney who says one thing, but really thinks another way.

Scene 16

Introduction:

"In the next scene try to imagine that you have asked a student to see you after class. You're very much concerned about his behavior and about his life in general. You want to help him."

Vignette:

(Male-Black) In a loud voice he swears and says he doesn't want your (the viewers) help.

Scene 17

Introduction:

"Try to imagine that you've been asked to serve as counselor to this next student. You are one of the few people who has been able to get along, at least reasonably well, with her. This is the second time you've seen her."

Vignette:

(Female-Black) The girl sits silently for several seconds, finally she shrugs disinterestedly and says all the talking is not doing any good.

Scene 18

Introduction:

"In this next scene, imagine that you are again alone with the student. You've been talking with him about your concern for the various things he's been doing. You've been trying to convey to him your concern that he's going to get into more and more serious difficulties if he persists."

Vignette:

(Male-Black) The boy remains silent, but looks all around and signs heavily several times.

Scene 19

Introduction:

"Finally you confront the student with the specifics of his behavior. You tell him precisely what you know he has done."

Vignette:

(Male-Black) The same student as in scene 18 says, "You're crazy! I wouldn't do anything like that! You're crazy!?

Scene 20

Introduction:

"In the next scene imagine that one of the students in your class has answered a question you have raised. Something about his answer struck you as rather humorous and in a good natured way you tease him. He responds."

Vignette:

(Male-Black) In a loud voice the boy shouts, "Leave me alone and get off my back!" He repeats himself several times.

Scene 21

Introduction:

"In the next scene try to imagine the following. One of the students in your class has asked to stay behind and talk with you today if its alright with you. As the class leaves, she remains--you think over your relationship with her. She's been a quiet student, you've seldom had to say much to her. You do recall that earlier in the day you had had a cross word or two for her but nothing particularly serious. You walk over to her, she looks at you and begins talking."

Vignette:

(Female-Black) In a tearful voice the girl wants to know what she can do to have the viewer like her.

Scene 22

Introduction:

"You try to respond to her but you can't quite find the right words. Its difficult to know what to say to her."

Vignette:

(Female-Black) The same student as in scene 21 says she can't figure out why you don't like her since she tries so hard. She is crying as the scene ends.

Scene 23

Introduction:

"Again you try to find something which may be helpful. You try to find something to say which will help her. She responds again."

Vignette:

(Female-Black) The same student as in scenes 21 and 22 again in a tearful voice suggests that maybe she isn't such a bad kid after all, she has never been in trouble and she really needs you. The scene ends as she says haltingly, "Please hold out your hand to me."

Scene 24

Introduction:

"In the next scene, imagine that you have spoken to the student about his strange behavior and you're concern about him."

Vignette:

(Male-White) The boy reports that he is different because he wants to be different.

Scene 25

Introduction:

"In the next scene imagine that you have just looked at the student--you've said nothing. You've been somewhat surprised by the things he's been saying. He looks at you and says."

Vignette:

(Male-White) The same boy as in scene 24 repeats several times that he is not crazy. The scene ends as he shouts he is not crazy and pounds on the desk while looking at the viewer.

Scene 26

Introduction:

"You ask the student what's happened. What have you done. Why is he upset?"

Vignette:

(Male-White) The same boy as in scenes 24 and 25 says in a quivering voice that you (the viewer) have really hurt him very deeply.

Scene 27

Introduction:

"During the lesson a student offers a comment. The comment is out of place and irrelevant. You tell him so and continue with the lesson. But you notice his reaction."

Vignette:

(Male-White) As the scene opens the boy has his head down and is crying. After several seconds he raises his head and in a sobbing voice says it is all your fault. (The "it" is unspecified.)

Scene 28

Introduction:

"You've asked a student to stay after class. You're discussing his difficulty with certain subject matter. And you're concerned that perhaps he simply has not put out enough effort and he could do better if he tried."

Vignette:

(Male-White) The same boy as in scene 27 still crying says you always pick on him, never call on him, hate him and are prejudiced.

Scene 29

Introduction:

"In the next scene imagine that you've had a confrontation with a student. You've reprimanded her and demanded that she do better and behave differently."

Vignette:

(Female-White) In a sarcastic and superior tone the girl states that you couldn't even afford to live in the community.

Scene 30

Introduction:

"You look at the student, almost in disbelief. She continues."

Vignette:

(Female-White) The same girl as in scene 29 again in a sneering tone says that if you could have made anything of yourself you wouldn't be a teacher.

Scene 31

Introduction:

"In the next scene imagine that you have told the student she may not talk to you that way. You have reminded her of your status within the system and of her role as a student."

Vignette:

(Female-White) The same girl as in scenes 29 and 30 in a superior manner says that if this ever happens again she will tell her father to go to the school board.

APPENDIX C

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APPENDIX D

CATEGORIES FOR INTERACTION ANALYSIS

TEACHER TALK	1.* ACCEPTS FEELING: accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings is included.
	2.* PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, but not at the expense of another individual; nodding head, or saying "um hm?" or "go on" are included.
	3.* ACCEPTS OR USES IDEAS OF STUDENTS: clarifying, building, or developing ideas suggested by a student. As teacher brings more of his own ideas into play, shift to Category 5.
	4.* ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer.
	5.* LECTURING: giving facts or opinions about content or procedures; expressing his own ideas, asking rhetorical questions.
	6.* GIVING DIRECTIONS: directions, commands, or orders with which a student is expected to comply.
	7.* CRITICIZING OR JUSTIFYING AUTHORITY: statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.
STUDENT TALK	8.* STUDENT TALK--RESPONSE: talk by students in response to teacher. Teacher initiates the contact or solicits student statement.
	9.* STUDENT TALK--INITIATION: talk by students, which they initiate. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.
	10.* SILENCE OR CONFUSION: pauses, short periods of silence, and periods of confusion in which communication cannot by understood by the observer.

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* There is NO scale implied by these numbers. Each number is classificatory; it designates a particular kind of communication event. To write these numbers down during observation is to enumerate--not to judge a position on a scale.

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APPENDIX E

SUCCESS RATING CHART

CRITERIA OF SUCCESS

A. Working with People

B. Establishing Classroom Climate

C. Planning Instruction

D. Managing Instruction

E. Command of Subject and Teaching Materials

F. Personal Qualities

G. Professional Qualities

H. General Effectiveness as a Teacher

SUCCESS RATING NUMBER	INTERPRETATION
1	One of the very best student teachers I have ever seen. Assign rating 1 to the most exceptional and outstanding student teacher of all. If you judge that a student is of absolutely outstanding accomplishment and will make a potentially great and profound effect on students, assign rating 1.
2	Highly successful. Assign rating 2 to those of somewhat lesser overall ability than rating 1 but nevertheless represent accomplished and outstanding student teaching performance. The highly successful student would rate close to rating 1 but is not one of the best student teachers you have ever seen.
3	Successful. Assign rating 3 to competent student teachers. Most should receive this rating and do not show the outstanding qualities of ratings 1 or 2.
4	Less successful. Assign rating 4 to those student teachers who have some problems and rate below the middle, that is, competent and successful, group in your center.
5	Passed but should not be in teaching. Assign rating 5 to those students who you feel ought to fail - they really are not inclined to teaching - but because of various reasons should not receive a failing grade.
6	Failed. Assign rating 6 to all student teachers who fail student teaching in your center.
7	Dropped/ grade postponed. Assign rating 7 to all student teachers who dropped student teaching or had their grade postponed for any reason at all.

APPENDIX F

SEMANTIC DIFFERENTIAL ATTITUDE SCALE

This instrument is being employed to collect data about student teachers' attitudes toward several topics. Please complete this form based on your own attitudes as a student teacher toward the topics. The information collected will be of considerable value in studying the student teaching process, and is for research purposes only.

Instructions

Work rapidly. Read the topic at the top of each page. Indicate your description of the topic by checking the blank that best describes your position between the adjectives on each line.

EXAMPLE: TOPIC: Brushing teeth

	3	2	1	0	1	2	3	
Interesting	___	___	___	___	___	___	___	Boring
Passive	___	___	___	___	___	___	___	Active

0. Check this blank if you have no position, the adjectives do not apply, or you are neutral.
1. Check this blank if you tend in the direction of description but only weakly so.
2. Check this blank if your feelings are stronger in direction.
3. Check this blank if your feelings are very strong.

Be sure to check one blank for every scale under each topic.

TOPIC: Myself as an interactor with the students in my class

	3	2	1	0	1	2	3	
Adequate	___	___	___	___	___	___	___	Inadequate
Untrustworthy	___	___	___	___	___	___	___	Trustworthy
Wanted	___	___	___	___	___	___	___	Unwanted
Unworthy	___	___	___	___	___	___	___	Worthy
Accepted	___	___	___	___	___	___	___	Unaccepted
Unable	___	___	___	___	___	___	___	Able
Successful	___	___	___	___	___	___	___	Unsuccessful
Incompetent	___	___	___	___	___	___	___	Competent
Helpful	___	___	___	___	___	___	___	Unhelpful
Unrespected	___	___	___	___	___	___	___	Respected
	3	2	1	0	1	2	3	

APPENDIX G

STUDENT TEACHERS' RANKING OF NEEDS

Below are sixteen (16) needs commonly identified by student teachers prior to student teaching. To help the College of Education plan for meeting the needs of future student teachers, would you please rank the list of needs using the numerals 1 through 16. Assign the numeral one (1) to the area in which you feel the greatest need, and the numeral sixteen (16) to the area in which you feel the least need.

____ Planning for Instruction

____ Handling Classroom Control

____ Evaluating Pupil Progress

____ Identifying and Planning for Handicapped Pupils

____ Constructing and Evaluating Teacher-made Tests

____ Judging the Adequacy of Teaching Materials

____ Identifying and Planning for Academically Talented Pupils

____ Teaching Reading in Your Content Area

____ Using Instructional Materials, Including Audio-Visual Equipment

____ Participating in Curriculum Study

____ Interpreting Biographical and Measurement Information

____ Reporting Pupil Progress

____ Interpreting School Policies and School Law

____ Maintaining Good School-Community Relations

____ Collecting and Recording Vital Information for Pupil Records

____ Maintaining Effective Working Relationships with School Personnel

APPENDIX H

APPENDIX H

Mean amount of time and corresponding per cent of time classified in each of the ten interaction categories for the experimental and control groups.

	Experimental		Control	
Interaction Category*	Amount of Time per 30 min.	Per Cent Time	Amount of Time per 30 min.	Per cent Time
1	<.01	<.01	<.01	<.01
2	1.87	6.20	1.61	5.30
3	0.93	3.10	0.91	3.00
4	4.33	14.40	3.64	12.10
5	12.37	41.20	13.51	45.00
6	0.48	1.60	0.39	1.30
7	0.18	0.60	0.30	1.00
8	5.13	17.10	3.70	12.30
9	2.38	7.90	2.08	6.90
10	2.39	7.90	4.14	13.80

*See Appendix D for identification

END

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